

**ENGINEERING DESIGN SERVICES AGREEMENT
FOR WASTEWATER COLLECTION SYSTEM MASTER PLAN UPDATE**

THIS AGREEMENT is made and entered into this ____ day of _____, _____, by and between the CITY OF LAS VEGAS, a municipal corporation within the State of Nevada (herein the "City"), and MWH AMERICAS, INC. (herein the "Consultant").

WITNESSETH:

WHEREAS, the City intends to evaluate the Collection System and have prepared a Master Plan Update (herein the "Project"); and

WHEREAS, the City desires to retain a qualified engineer who will be responsible for providing the engineering services hereinafter set forth below; and

WHEREAS, the Consultant is properly licensed and qualified in accordance with the Nevada Revised Statutes as an engineer and has the personnel and facilities necessary to perform the services hereinafter set forth within the time required under this Agreement.

NOW, THEREFORE, in consideration of the above premises, the parties hereto agree to the following terms, conditions and covenants set forth in Sections One through Ten hereof:

**SECTION ONE
CONSULTANT RESPONSIBILITIES**

1.01 Consultant Services. The Consultant hereby agrees to provide the basic services and the additional services set forth in Exhibit "A" (Scope of Services) and Exhibit "B" (Additional Services) attached hereto.

1.02 Performance Standards. In performing the services set forth in this Agreement, the Consultant shall follow practices consistent with generally accepted within the engineering profession.

1.03 Document Review. The Consultant shall be responsible for reviewing each document prepared by the Consultant and its subconsultants for the purpose of ensuring that such documents are technically sound, in conformance with applicable federal, state and local statutes, codes, ordinances and other regulations, and do not violate or infringe upon any patent rights.

1.04 Waiver. The City's approval of any documents or services furnished by the Consultant shall not in any way relieve the Consultant of responsibility for the professional and technical accuracy of its documents or services. The City's review, approval, acceptance or payment for any of the Consultant's services shall not be construed to operate as a waiver of any rights enjoyed by the City under this Agreement or of any cause of action arising out of the performance of this Agreement. The Consultant shall remain liable in accordance with the terms of this Agreement and applicable law for the damages to the City caused by the Consultant's negligent act or omission committed in the performance of this Agreement.

1.05 Consultant Representative. The Consultant's Representative is hereby designated as Mark Nelson, P.E., Project Manager, who shall be responsible for the services required under this Agreement. All of the services specified by this Agreement shall be performed by the Consultant's Representative, or by the associates and employees identified in the Consultant's proposal provided that such associates and employees perform under the personal supervision of the Consultant's Representative. All employees identified in the Consultant's cost proposal shall be subject to approval by the City's Representative. Should the Consultant's Representative, or any associate or employee, be unable to complete his or her responsibility for any reason, the Consultant will replace the employee with a qualified person approved by the City. If the Consultant fails to make a required replacement within thirty (30) days, the City may terminate this Agreement for default as provided in Section 10.03 of this Agreement.

1.06 Correspondence Review. The Consultant shall furnish the City's Representative copies of each correspondence, if any, sent to the Contractor and to any regulatory agencies for approval and review prior to the mailing such correspondence.

1.07 Cooperation with the City. The Consultant agrees that its officers, associates, employees and subconsultants will cooperate with the City in providing services under this Agreement and will be, with advance notice, available for consultation with the City at such reasonable times as to not conflict with the City's other responsibilities.

SECTION TWO CITY RESPONSIBILITIES

2.01 City Representative. The Director of Public Works or his authorized representative is hereby designated as the City's Representative with respect to this Agreement. The City's Representative shall have complete authority to transmit instructions, receive information, interpret and define the City's policies and decisions with respect to the services of the Consultant.

2.02 Review of Services and Documents. The services to be performed by the Consultant shall be subject to periodic review by the City's Representative. To prevent an unreasonable delay in the Project, the City's Representative will endeavor to examine and comment in writing on the documents furnished by the Consultant within twenty-one (21) days of receipt of such documents.

2.03 Access to Records. The City shall, without charge, furnish a copy to, or make available for examination or use by, the Consultant, as it may request, any documents and data which the City has available including, without limitation, reports, maps, plans, specifications, surveys, records, ordinances, codes, regulations, other documents related to the services required under this Agreement. The City shall assist the Consultant in obtaining data and documents from public agencies and from private citizens and business firms whenever the City determines that such material is necessary for the completion of the services required by this Agreement.

CONSULTANT shall be entitled to reasonably rely upon the information provided by CITY,

CITY's representatives, or from generally accepted sources without independent verification except to the extent such verification is expressly included in the scope of Services.

2.04 Cooperation with Consultant. The City agrees that its officers and employees will cooperate with the Consultant in the performance of this Agreement and will be, with advance notice, available for consultation with the Consultant at such reasonable times as to not conflict with the Consultant's other responsibilities.

SECTION THREE CHANGES TO CONSULTANT'S SERVICES

3.01 Requested Changes. The Director of Public Works or his authorized representative may at any time, by written order, make changes which may result in an increase or decrease in the services to be performed by the Consultant under this Agreement.

3.02 Adjustment of Compensation. If the changes requested by the City cause an increase or decrease in the cost or time required to perform any of the services required hereunder, an equitable adjustment shall be made in the compensation to be paid to the Consultant under Section Seven, or in the time of performance under Section Eight, or both, and this Agreement shall be modified in writing accordingly. Any claim for adjustment under this Section must be asserted in writing within thirty (30) days from the date of receipt by the Consultant of written notification of the changes to the services to be provided by the Consultant unless the City grants in writing a further period of time. Failure to assert such claim within the time limit provided herein shall constitute a waiver of any right to seek any equitable adjustment in compensation with respect to that change.

SECTION FOUR ADDITIONAL SERVICES OF CONSULTANT

4.01 Additional Services. The Consultant shall provide the additional services described in Exhibit "B" attached hereto if, and only if, so requested in writing by the City. Payment for the additional services will be made to the Consultant in accordance with Section Seven of this Agreement.

4.02 Attendance at Meetings or Public Hearings. The Consultant shall notify the City in advance of any additional costs which may be incurred prior to attending any meetings or public hearings as may be necessary to clarify the interpretation of the services performed by the Consultant under this Agreement.

SECTION FIVE SUB-CONSULTANT AGREEMENT

5.01 Sub-consultant Provisions. In the event that the Consultant with the approval of the City as required under Section 10.07 enters into an agreement with a sub-consultant for the

performance of any of its obligations hereunder, the following provisions shall be included in each sub-consultant agreement:

(i) The Consultant agrees to pay the sub-consultant when paid by the City for that portion of the services provided to the City and no liability shall arise on the part of the Consultant to the sub-consultant for payment of the sub-consultant services until payment has been made to the Consultant by the City. If the City has paid the Consultant for said sub-consultant services, the subconsultant's only recourse is against the Consultant and not against the City, either through the institution of legal or equitable action or the attachment of any lien,

(ii) The sub-consultant shall have no more rights against the City than that of the Consultant,

(iii) The sub-consultant agrees to be bound by all the terms, conditions and obligation of this Agreement unless the City has approved any deviation, change or modification in writing, and

(iv) Unless otherwise approved by the City's Representative, the subconsultant will obtain and maintain professional liability insurance (Errors and Omissions coverage) in connection with the subconsultant services in an amount equal to that required of the Consultant as provided in subsection C of Section 10.05 of this Agreement.

(v) Use of staff from Consultant's parent company, subsidiary, affiliate or division shall not be considered a subcontracting or assignment of services.

SECTION SIX TERM OF AGREEMENT

6.01 Term. This Agreement shall commence on the day it is approved by the City Council or other person duly authorized to execute this Agreement (which shall be inserted in the first paragraph set forth above) and shall remain in force and effect until the Project is completed unless the City serves upon the Consultant a thirty (30) day written Notice of Termination pursuant to Section 10.02. The termination of this Agreement shall not release either party from any of its continuing obligations hereunder.

6.02 Disputes. This Section shall not be construed to preclude the filing of any dispute arising out of the performance of this Agreement or in connection with the subject matter hereof, nor shall this Section be construed to change the date or the time on which a cause of action arising out of the performance of this Agreement or in connection with the subject matter hereof, would otherwise accrue under the statutes of limitation or doctrines of law.

SECTION SEVEN COMPENSATION AND TERMS OF PAYMENT

7.01 General. At the time of approval of this Agreement by the City Council, the City agrees to set aside \$1,747,401.00 (one million seven hundred forty-seven thousand four hundred one) as the total appropriation for the performance of this Agreement. In no event shall the total payments to the Consultant for the services (basic and additional services) provided under this Agreement exceed the aforementioned amount appropriated without prior approval of the City.

7.02 Compensation: Basic Services (Lump Sum by Task). The City agrees to pay the lump sum amount attributable to each task and, if applicable, each subtask, set forth in Exhibit "A" which is completed by the Consultant. The Consultant agrees to complete each task and, if applicable, each subtask, for the amount of the lump sum set forth in Exhibit "D" regardless of the number of manhours which must be expended to complete the performance of this Agreement. The total payments to the Consultant for the completion of these tasks shall not exceed \$1,592,788.00 (*one million five hundred ninety-two thousand seven hundred eight-eight*) without prior written approval from the City. Such payment is based upon the individual lump sum amounts that are identified in Exhibit "D", being derived from the manhour estimates (including subconsultants) set forth in Exhibit "C" attached hereto.

7.03 Compensation: Additional Services. For the additional services set forth in Exhibit "B," the City shall pay to the Consultant either a lump sum or an hourly fee based upon the hourly rates set forth in Exhibit "D" attached hereto, whichever is approved in writing by the City's Representative. Such payment shall not exceed \$154,613 (*one hundred fifty-four thousand six hundred thirteen*) without the prior written approval of the City.

7.04 Invoice. An invoice shall be submitted to the City each month for the services provided during the previous month. An original invoice and one copy shall be provided to the City's Representative in the format of Exhibit "F" (Invoice Format) attached hereto. Payment shall be due within 45 days after the date of receipt and approval by the City's Representative of the monthly invoice. Failure to pay the Consultant within the 45 day period shall result in a one-half of one percent (1/2%) charge on the unpaid balance unless the City has notified the Consultant within the aforementioned period that it is disputing the amount due and owing under the invoice. Such disputes shall be handled as provided in Section 10.20A of this Agreement.

In the event payment for the Services has not been made within 60 calendar days from the date of the invoice, CONSULTANT may, after giving 7 calendar days written notice and without penalty or liability of any nature, and without waiving any claim against CITY, suspend all or any part of the Services.

7.05 Right of Set-Off. The City's Representative shall give Consultant notice of alleged deficiency and a reasonable opportunity to cure before implementing the right to set off. The City's Representative may subtract or offset the unpaid invoice from the Consultant any damages, costs and expenses caused by reason of, or as a consequence of, the negligent, or reckless act or omission of the Consultant in the performance of the services under this Agreement including, without limitation, errors or deficiencies in the plans, drawings,

specifications and other documents prepared by the Consultant. City and Consultant shall observe the Dispute Resolution Process, Section 10.20 below.

7.06 Release of Retention. Upon completion by the Consultant of the basic services required under this Agreement, acceptance of such services by the City (which acceptance will not be unreasonably withheld), and issuance of the Notice to Proceed for construction of the Project, the Consultant will, within forty-five (45) days, be paid the balance of any money due for such services, including the retained percentages.

7.07 Final Payment. Within thirty (30) days after the completion of construction and close-out of the Project, the City shall make the final payment for any additional services which might have been provided by the Consultant.

SECTION EIGHT PERFORMANCE SCHEDULE

8.01 Performance Schedule. The parties hereto have agreed to a general performance schedule (the "General Performance Schedule") which is set forth in Exhibit "E" attached hereto. Subsequent to the execution of this Agreement, the Consultant shall furnish to the City's Representative for approval a more detailed schedule of performance (herein the "Detailed Performance Schedule") to be attached hereto as Exhibit "E-1" no later than ten (10) days after Consultant receives written notice to proceed from the City's Representative. The Detailed Performance Schedule shall identify the time for each of the tasks set forth in Exhibit "A" attached hereto as the period of time that may reasonably be required to complete the tasks identified. The format of the Detailed Performance Schedule shall be based on a cost-loaded, task-oriented diagram. In preparing the Detailed Performance Schedule, the Consultant will provide (21) days for each document that is to be reviewed by the City.

8.02 Revised Performance Schedule. If the Consultant's performance is delayed or the sequence of tasks changed, the Consultant shall notify the City's Representative in writing of the reasons for the delay or the change. The Consultant shall then prepare a revised General and Detailed Performance Schedule for submission to and approval by the City's Representative.

SECTION NINE AUDIT: ACCESS TO RECORDS

9.01 Records. The Consultant shall maintain books, records and other documents directly pertinent to performance of this Agreement in accordance with generally accepted accounting principles and practices for a period of three (3) years after completion of this Agreement except that books, records or other documents which are subject of a pending audit shall be mentioned for three (3) years after the completion of the audit. The Consultant shall also maintain the financial information and data used by the Consultant in the preparation or support of the invoices submitted to the City. Audits conducted pursuant to this provision shall be in accordance with generally accepted auditing standards, procedures and guidelines of the City, or

its designated representative. The City, or its duly authorized representatives, shall have access to such books, records, and documents during normal business hours for the purpose of inspection, audit and copying. The Consultant will provide proper facilities for such access and inspection.

If the books, records or other documents are not located within Clark County, Nevada, then in the event of an audit, Consultant agrees to deliver the same to the address designated by the City. If the books, records or other documents are incomplete, Consultant agrees to pay for the City's designated representative's cost to travel to Consultant's office to retrieve the omitted information needed for purposes of the audit.

9.02 Disclosure. The Consultant agrees to the disclosure of the information and reports resulting from access to records pursuant to Section 9.01 of this Agreement above provided that the Consultant is afforded the opportunity for an audit entrance and exit conference and an opportunity to comment and submit any supporting documentation on the pertinent portions of the draft audit report, and that the final audit report will include written comments, if any, of the Consultant.

9.03 Period of Maintenance. The books, records and other documents under Sections 9.01 and 9.02 of this Agreement shall be maintained for three (3) years after the date of the final payment for the services under this Agreement. In addition, those records and other documents which relate to any arbitration, litigation or the settlement of any claim arising out of this Agreement, or to which an audit exception has been taken, shall be maintained and made available until three (3) years after the date that the arbitration, litigation or exception has been resolved.

9.04 Subcontract Provisions. The Consultant agrees to include Sections 9.01 through 9.03 of this Agreement in all its subcontracts directly related to performance of services specified in this Agreement which are in excess of \$10,000.

SECTION TEN MISCELLANEOUS PROVISIONS

10.01 Suspension. The City may suspend performance by the Consultant under this Agreement for such period of time as the City, in its sole discretion, may prescribe by providing written notice to the Consultant at least ten (10) days prior to the effective date of the suspension. With such suspension, the City shall pay to the Consultant the amount of compensation, based on percentage of completion of the Project, earned until the effective date of suspension less all previous payments. The Consultant shall not provide any further services under this Agreement after the effective date of suspension until otherwise notified in writing by the City. In the event the City suspends performance by the Consultant for any cause other than the error or omission of the Consultant for an aggregate period in excess of thirty (30) days, the Consultant shall be entitled to an equitable adjustment of the compensation payable to the Consultant under this Agreement, including reimbursement to Consultant for additional costs occasioned as a result of such suspension of performance. In no event shall the City be liable to the Consultant for more than the percentage completed at the time of suspension.

10.02 Termination for Convenience. The City reserves the right to terminate this Agreement without cause or default on the part of the Consultant with the service of ten (10) days' prior written notification to the Consultant as provided in Section 10.18. In the event of termination, without cause or default, the City agrees to pay to the Consultant the reasonable value for the services performed as of the date that notification of termination is received by the Consultant.

10.03 Termination for Default. The occurrence of any of the following events shall constitute a default by the Consultant hereunder (herein "Event of Default"):

(i) If the Consultant shall default in the due observance and performance of any term, condition or covenant contained in this Agreement,

(ii) If the Consultant shall (a) voluntarily terminate operations or consent to the appointment of a receiver, trustee or liquidator of the Consultant for all or a substantial portion of its assets, (b) be adjudicated bankrupt or insolvent or file a voluntary petition in bankruptcy, or admit in writing to the inability to pay its debts as they become due, (c) make a general assignment for the benefit of creditors, (d) file a petition or answer seeking reorganization or an arrangement with creditors or take advantage of any insolvency law, or (e) if action shall be taken by the Consultant for the purpose of effecting any of the foregoing,

(iii) If any warrant, execution or other writ shall be issued or levied upon any property or assets of the Consultant and shall continue unvacated and in effect for a period of thirty (30) days, or

(iv) If the Consultant, in the judgment of the City, fails to provide the services hereunder properly and with proper dispatch in accordance with the time schedule set forth in Section Eight of this Agreement, and

(v) If such Event of Default continues for five (5) days after written notice to the Consultant,

then the City may, without prejudice to any other remedy it may have at law or in equity, (a) terminate this Agreement, suspend payment of all pending invoices otherwise due to the Consultant hereunder, and finish this Agreement by such means as the City may see fit, reserving the right to deduct from any invoice balance due the Consultant for services rendered, the reasonable and necessary cost of completing the performance of this Agreement with the remaining funds originally set aside and budgeted therefor and paying the excess, if any, to the Consultant and in the event the cost of finishing the Consultant's work exceeds the invoice balance due the Consultant, such deficiency shall be paid by the Consultant to the City within five (5) days of receipt of an invoice from the City, or (b) terminate this Agreement and all the obligations imposed hereunder, including the obligation of any further payment for the services of the Consultant except for the reasonable value for the services performed as of the date of receipt of the notice of termination. The cost and expense of completing this Agreement shall be computed and audited by the City's Representative. The audit shall be made in accordance with generally accepted accounting principles and the Consultant shall pay the costs of such audit.

It is expressly agreed that the City reserves the right to offset any and all claims made by the Consultant for payment of its fees or the reimbursement of additional costs incurred hereunder, with any claims that the City might have against the Consultant for failure to comply with any of the terms, conditions or covenants of this Agreement.

10.04 Ownership of Documents. Any and all plans, drawings, specifications and other documents (including electronic media) prepared or assembled by the Consultant, or any of its subconsultants, which are related to the performance of this Agreement are deemed to be the property of the City. In the event of the completion or termination of this Agreement, the City shall be entitled to the original plans, drawings, specifications and other documents related to this Agreement not in its possession. The plans, drawings, specifications and other documents may be utilized by the City for its own use for which they were prepared, and for use on other projects which may have parts in common with the Project, but not for the construction of any other project.

10.05 Insurance.

A. Coverages. The Consultant shall procure and maintain, at its own expense, during the entire term of the Agreement, the following policies of insurance:

(i) Worker's Compensation Insurance protecting the Consultant and the City from employee claims based on job-related sickness, disease, or accident.

(ii) Commercial General Liability Insurance protecting the Consultant, from claims of personal injury (including death) and property damage. Such coverage shall be in a minimum amount of \$1,000,000 for the period of time covered by this Agreement. The policy shall be endorsed to include the City as an additional insured party thereunder.

(iii) Automobile Liability Insurance in the amount of \$1,000,000 per occurrence and covering owned, hired and non-owned vehicles. The policy shall be endorsed to include the City as an additional insured party thereunder.

(iv) Professional Liability Insurance (Errors and Omissions Coverage) protecting the Consultant from claims arising out of performance of professional services caused by a negligent act or omission for which the insured is legally liable. Such coverage shall be in a minimum amount of \$1,000,000 for the period of time covered by this Agreement.

B. Cancellation or Modification of Coverage. The Consultant's Commercial General Liability and Professional Liability Insurance Policies shall automatically include or be endorsed to cover the Consultant's contractual liability to the City under this Agreement. With the exception of Professional Liability, all policies shall be endorsed to waive subrogation against the City, its officers, agents, servants and employees. All policies under this Agreement shall provide that the City will be given thirty (30) days' notice in writing of any cancellation of, or material change in, the policies. [NOTE: Waiver of subrogation is not available on Professional Liability Policies]

C. ***Certificates and Endorsements.*** The certificates and endorsements for each insurance policy are to be signed by a person authorized by that insurer and licensed by the State of Nevada. All deductibles and self-insured retentions shall be fully disclosed in the Certificate of Insurance. No deductible or self-insured retention may exceed \$25,000 without the written approval of the City. Certificates indicating that such insurance is in effect shall be delivered to the City before any services are provided under this Agreement.

D. ***Period of Coverage.*** If the insurance coverage is underwritten on a "claims made" basis, the retroactive date shall be prior to or coincident with the date of this Agreement and the Certificate of Insurance shall state such coverage and the retroactive date. Upon availability, the Consultant shall maintain coverage for the duration of this Agreement and for two years following completion of this Agreement. The Consultant shall provide the City annually a Certificate of Insurance as evidence of such insurance.

10.06 Indemnity. Notwithstanding any of the insurance requirements set forth in Section 10.05, and not in lieu thereof, the Consultant shall protect, indemnify and hold the City, its officers, employees, and agents (herein the "Indemnitees") harmless from any and all claims, damages, losses, expenses, suits, actions, decrees, judgments, arbitration awards, attorney fees and court costs (herein the "Claims") which the Indemnitees, or any of them, may suffer as a result of, by reason of, or as a consequence of, the negligent or reckless act or omission of the Consultant, its subcontractors, agents or anyone employed by the Consultant, its subcontractors or agents, in the performance of this Agreement.

As part of its obligation hereunder, the Consultant shall, at its own expense, defend the Indemnitees against the Claims which may be brought against them, or any of them, as a result of, by reason of, or as a consequence of, the negligent, reckless act or omission of the Consultant, its subcontractors or agents, for and against which the Consultant is obligated to indemnify the Indemnitees unless the Indemnitees, or any of them, elect to conduct their own defense which, in such case, shall not cause a waiver of the obligation of indemnification set forth herein. If the Consultant shall fail to do so, the Indemnitees, and each of them, shall have the right, but not the obligation, to defend the same and charge all direct and incidental costs of such defense (including attorney fees and court costs) against the Consultant.

10.07 Assignment. The City and the Consultant each bind itself and its partners, successors, administrators and assigns to the other party of this Agreement and to the partners, successors, executors, administrators and assigns of such other party in respect to all covenants of this Agreement, except the Consultant shall not assign, sublet or transfer any obligation or benefit under this Agreement without the written consent of the City. Nothing contained herein shall be construed as creating any personal liability on the part of any officer or agent of the City.

10.08 Waiver. No consent or waiver, express or implied, by either party to this Agreement, or of any breach or default by the other in the performance of any obligations hereunder, shall be deemed or construed to be a consent or waiver of any other breach or default by such party hereunder. Failure on the part of any party hereto to complain of any act, or failure to act of the other party, or to declare that other party in default hereunder, irrespective of how long such failure continues, shall not constitute a waiver of the rights of such party hereunder. Inspection, payment, or tentative approval or acceptance by the City or the failure of the City to perform any inspection hereunder, shall not constitute a final acceptance of the work or any part thereof and shall not release the Consultant of any of its obligations hereunder.

10.09 Consultant Representations. The Consultant hereby represents:

(i) That it is financially solvent, able to pay its debts as they mature, and is possessed of sufficient working capital to complete this Agreement; that it is experienced, qualified and is able to furnish the plant, tools, materials, supplies, equipment, facilities and personnel, and is experienced in and competent to perform the services contemplated by this Agreement, and that it is qualified to provide such services and is authorized to do business in the State of Nevada,

(ii) That it holds a license, permit or other special license to perform the services included in this Agreement, as required by law, or employs or works under the general supervision of the holder of such license, permit or special license, and

(iii) That it has, pursuant to the requirements of Resolution 79-99 adopted by the City Council on August 4, 1999 (effective October 1, 1999) as amended by Resolution 105-99 (adopted by the City Council on November 17, 1999), disclosed on the form attached hereto as Exhibit "G", all of the principals, including partners, of the Consultant, as well as all persons and entities holding more than a one percent (1%) interest in the Consultant or any principals of the Consultant. If the Consultant, or its principals or partners, are required to provide disclosure under federal law (such as Securities and Exchange Commission or the Employee Retirement Income Act) and current copies of such federal disclosures are attached to Exhibit "G", the requirements of this Section shall be deemed satisfied. During the term of this Agreement, the Consultant shall notify the City in writing of any material change in the above disclosure on Exhibit "G" within 15 days of such change.

10.10 Consultant's Employees. The Consultant shall be responsible for maintaining satisfactory standards of employee competency, conduct and integrity, and shall be responsible for taking such disciplinary action with respect to its employees as may be necessary. In the event the Consultant fails to remove any employee from the contract work whom the City deems incompetent, careless or insubordinate, or whose continued employment on the work is deemed by the City to be contrary to the public interest, the City reserves the right to require such removal as a condition for the continuation of this Agreement.

10.11 Independent Contractor. It is hereby expressly agreed and understood that in the performance of the services required herein, the Consultant and any other person employed by

him hereunder shall be deemed to be an independent contractor and not an agent or employee of the City.

10.12 *Applicable Law.* This Agreement shall be construed and interpreted in accordance with the laws of the State of Nevada.

10.13 *Compliance with Laws.* The Consultant shall in the performance of its obligations hereunder comply with the applicable laws, rules and regulations of the governmental authorities having jurisdiction over the performance of this Agreement including, without limitation, the Federal Occupational Health and Safety Act and the state and federal laws prohibiting and/or related to discrimination by reason of race, sex, age, religion or national origin.

10.14 *Severability.* In the event that any provisions of this Agreement shall be held to be invalid or unenforceable, the remaining provisions of this Agreement shall remain valid and binding on the parties hereto.

10.15 *Confidentiality.* The Consultant shall treat the information relating to the Project, which has been produced by the Consultant or provided by the City as confidential and proprietary information of the City and shall not permit its release to other parties or make any public announcement or publicity release without the City's written authorization. The Consultant shall also require subcontractors to comply with this requirement.

10.16 *Site Inspection.* Not Applicable

10.17 *Modification.* All modification or amendments to this Agreement are null and void unless reduced in writing and signed by the parties hereto.

10.18 *Notice.* Any notice required to be given hereunder shall be deemed to have been given when the notice is (i) received by the party to whom it is directed by personal service, (ii) telephonically faxed to the telephone number below provided confirmation of transmission is received thereof, or (iii) deposited as registered or certified mail, return receipt requested with the United States Postal Service, addressed as follows:

TO CITY:

John Day, P.E.
City of Las Vegas
731 S. 4th Street
Las Vegas, Nevada 89101

Fax: (702) 382-8551

TO CONSULTANT:

Mr. Mark Nelson, P.E.
MWH
3014 West Charleston Blvd.
Las Vegas, NV 89102

10.19 Prohibition Against Contingent Fees. The Consultant represents and warrants that no person or entity has been employed or retained to solicit or secure this Agreement with the Agreement or understanding that a commission, percentage, brokerage or contingent fee would be paid to that person. For breach or violation of this provision, the City shall have the right to annul this Agreement without liability or, in its discretion, to deduct from the compensation to be paid to the Consultant, or otherwise recover, the full amount of such commission, percentage, brokerage or contingent fee.

10.20 Dispute Resolution.

A. Fee Disputes. Any fee dispute arising under this Agreement which is not disposed of by mutual agreement between the parties shall be decided by the City Manager, whose decision shall be reduced to writing and mailed or otherwise furnish a copy thereof, to the Consultant. The decision of the City Manager shall be final and conclusive unless, within thirty (30) days after the date on which the Consultant receives its copy of such decision, the Consultant mails or otherwise furnishes to the City Manager a written appeal from the decision, addressed to the City Council in care of the Director of Public Works. The Consultant shall be afforded an opportunity to be heard and to offer evidence in support of its appeal. The rights and responsibilities of the parties shall be in accordance with Section 7.04 above.

If, during the performance of this Agreement, a dispute arises between the parties as to whether the services provided by the Consultant are basic services, or services entitled to additional compensation, the Consultant agrees to notify the City prior to providing such services of the Consultant's intent to seek additional compensation as provided in this Section. Such notice shall be for the purpose of affording the City the opportunity to monitor and verify the performance of the additional services and failure to provide the City with such notice prior to providing the services shall constitute forever a bar and a waiver of such claim.

B. Non-Fee Disputes. All non-fee claims, disputes and other matters in question between the parties to this Agreement arising out of or relating to the performance of this Agreement, or the breach thereof, shall be decided by arbitration or litigation, whichever manner of resolution is designated by the City. As a prerequisite to the exercise of such right, the party seeking to arbitrate or litigate a claim, dispute or other matter shall notify the other party as required under subsection D of this Section. For each claim asserted by the Consultant, the City shall notify the Consultant within thirty (30) days of receipt of such notice as to the designated forum for resolving the claim, dispute or other matter. Failure of the City to notify the Consultant within the aforementioned thirty (30) days shall be deemed to be an election on the part of the City to arbitrate the claim, dispute or other matter in question between the parties. For each claim asserted by the City, the notice provided to the Consultant under subsection D of this Section shall also state the forum selected by the City for resolving the claim, dispute or other matter in question between the parties.

If the claim, dispute or other matter is to be decided by arbitration, then such determination shall be made according to the current arbitration rules of the American Arbitration Association or the Nevada Arbitration Association, whichever is selected by the City.

Any arbitration arising out of or relating to this Agreement may include, by consolidation, joinder or in any other manner, any additional person not a party to this Agreement if so requested by either party to this Agreement. Any consent to arbitration involving an additional person or persons shall not constitute consent to arbitration of any dispute not described therein. This agreement to arbitrate with an additional person or persons, and any decision resulting therefrom, shall be binding and enforceable under the prevailing arbitration laws of the State of Nevada.

C. *Right of Joinder.* In the event the City is named as a party to any arbitration action, or commences an arbitration action against a party other than the Consultant, which action arises out of, results from or is connected with the construction of the Project or the performance of the Consultant's services hereunder (such as, without limitation, any arbitration action between the City and the contractor awarded the contract to construct the Project), the Consultant agrees and hereby irrevocably consents to be joined as a party in the arbitration proceeding and to be bound by any decision resulting therefrom. Any joinder of the Consultant hereunder is conditioned upon the handling of such arbitration in accordance with the arbitration rules of the Nevada Arbitration Association or the American Arbitration Association or as otherwise agreed to by the parties. None of the time provisions imposed under Subsection D and E of this Section apply to the joinder rights provided herein in such a way as to preclude the City from joining the Consultant as a party to any arbitration proceeding which the City commences or is named as a party and which arises out of, results from or is connected with the construction of the Project.

If the Consultant is named as an additional party by the City, the Consultant shall not be entitled to any additional compensation from the City as a result of preparing for, and participating in, the arbitration.

D. *Notice of Claim.* In order to be able to arbitrate or litigate any claim, dispute or other matter in question between the parties under Subsection B of this Section, written notice thereof must be given by the party requesting the arbitration or litigation to the other party within thirty (30) days, in the case of notice to the City, or within sixty (60) days, in the case of notice to the Consultant, after the claim, dispute or other matter arises. The purpose of such notification is to place the notified party on notice so that proper measures can be taken to properly defend against such claim, dispute or other matter, and the failure to give such notice shall preclude the party desiring arbitration or litigation from subsequently arbitrating or litigating that particular claim, dispute or other matter.

E. *Notice of Arbitration.* The filing of the aforementioned notice of claim shall preserve that party's right to arbitration, but shall not obligate the party to proceed with arbitration. In the event that the party requesting arbitration desires to proceed with the arbitration, a written demand for arbitration shall be filed in writing with the other party and with the American Arbitration Association or the Nevada Arbitration Association within sixty (60) days after the filing of the Certificate of Substantial Completion with respect to the Project or final payment to the Consultant, whichever is the first to occur, and the failure to make such demand shall forever bar such claim, dispute or other matter from being arbitrated or litigated.

F. **Discovery.** In the event of arbitration, it is agreed by the parties hereto that all means of discovery including, but not limited to, depositions and interrogatories will be afforded to the parties involved in the arbitration, and the appointed arbitrator shall have all authority to impose sanctions against either party for failing to comply with the rules of discovery provided under the Nevada Rules of Civil Procedure.

G. **Award Final.** The award rendered by the arbitrator shall be final, and judgment may be entered upon its accordance with applicable law in any court having jurisdiction thereof.

H. **Mediation.** By mutual written consent, in addition to the remedy of arbitration, the parties may endeavor to settle the claim, dispute or other matter in question between the parties by mediation in accordance with the current mediation rules of the Nevada Arbitration Association, the American Arbitration Association or other mediation service agreed to by the parties. Such mediation may occur at any time, including prior to the date that a hearing may have been scheduled for the arbitration. If a written request for mediation arises prior to the expiration of the sixty (60) day notice requirement set forth in Subsection E of this Section, then such time period shall be tolled (i) for a period of ten (10) days while the request is agreed to or denied, or (ii) if the request for mediation is agreed to, then until completion of the mediation.

10.21 Calendar Day. All references in this Agreement to days are to calendar days unless otherwise indicated.

10.22 Exhibits. All exhibits referenced in this Agreement are hereby incorporated as a part of this Agreement.

10.23 Agreements Version. This Agreement utilizes the City's standard form updated as of August 7, 2002.

IN WITNESS WHEREOF, the parties have caused this Agreement to be executed the day and year first above written.

CITY OF LAS VEGAS

By: _____
OSCAR B. GOODMAN, Mayor

"City"

ATTEST:

BARBARA JO RONEMUS, City Clerk

APPROVED AS TO FORM:

Thomas R. Green 6/5/06
Deputy City Attorney Date
Thomas R. Green

MWH Americas, Inc.

Thomas Rowlett

By: Thomas Rowlett, P.E.

Its: Regional Manager

"Consultant"

EXHIBITS

Exhibit “A”	Scope of Services (Sections 1.01, 7.02, 8.01)
Exhibit “B”	Additional Services (Sections 1.01, 4.01, 7.03)
Exhibit “C”	Manhour Estimates (Section 7.02)
Exhibit “D”	Cost Derivative and Hourly Fee Schedule (Sections 7.02, 7.03)
Exhibit “E”	General Performance Schedule (Section 8.01)
Exhibit “E-1”	Detailed Performance Schedule (Section 8.01)
Exhibit “F”	Invoice Format (Section 7.04)
Exhibit “G”	Disclosure of Principals (Section 10.09)

EXHIBIT A

SCOPE OF WORK

This exhibit describes the CONSULTANT's Scope of Work for the Wastewater Collection System Master Plan Update (Master Plan Update) for the City of Las Vegas (CITY). The objective of this study is to develop a comprehensive planning document that can be utilized by CITY staff to fund and implement required capacity improvements to the existing CITY sewer system and expansion of sewerage facilities to serve new development. The product of this study will be a Master Plan Update Report that includes recommended sewer improvement and expansion projects, including project descriptions, estimated costs, and proposed schedules for implementation.

The tasks and subtasks included in the CONSULTANT's Scope of Work are described below. The major task headings are:

- Task 1 Compile and Review Existing Information
- Task 2 Additional Data Collection
- Task 3 Review and Update Land Use Planning Criteria
- Task 4 Review and Update Flow Criteria
- Task 5 Evaluate Hydraulic Modeling Software
- Task 6 Construct and Verify Model of the Existing System
- Task 7 Develop Future Flows and Sewersheds
- Task 8 Perform Hydraulic Analysis and Identify Deficiencies of Existing System
- Task 9 Review and Refine Facility Design and Cost Criteria
- Task 10 Review and Evaluate WRF Sites
- Task 11 Develop Sewerage Facilities Expansion Projects
- Task 12 Develop Improvement Projects for the Existing Trunk Sewer System
- Task 13 Develop Capital Improvement Program
- Task 14 Prepare Master Plan Report
- Task 15 Model Installation and Training
- Task 16 Project Management and Coordination

The anticipated work products are listed following each subtask description. Work products include formal deliverables such as Technical Memoranda (TMs) and reports to be submitted for review by the CITY; as well as interim memoranda, data, calculations, and mapping developed for informal review by CITY staff and/or transfer of information to other tasks. All TMs will initially be submitted in draft form (5 paper copies and an electronic copy [pdf format]) for review by CITY staff. A review period of 3 weeks by the CITY is planned for each submittal. Comments will be incorporated into the final draft TMs to be included in the draft Master Plan Update report, unless comments are substantial, in which case revised draft TMs will be re-submitted for review. All digital mapping and project drawing deliverables will be submitted in ArcGIS and PDF format.

CLV Collection System Master Plan Update - Scope of Work

TASK DESCRIPTIONS

Task 1 - Compile and Review Existing Information

The objective of this task will be to assemble, organize, and review maps and documents related to the Master Plan and summarize this information in a format that will be useful for subsequent tasks.

Subtask 1.1 - Compile, Organize, and Summarize Existing Documents and Data. In conjunction with CITY staff, the CONSULTANT will identify pertinent documents and data that provide information required for the Master Plan. These documents will include planning information; previous reports related to the sewer system; design criteria and standards; water consumption information; and relevant work products of related projects such as the Unlined RCP Sewer Evaluation and Rehabilitation projects. Key sources of data for the Master Plan Update will also be identified, including sewer system maps and record drawings, GIS maps and databases, assessor parcel information, utility billing information, flow and rainfall data, maintenance information, and cost data.

Work Product: *List of existing documents and information, organized by subject area.*

Subtask 1.2 – Assessment of Sewer GIS Database. The CONSULTANT will review the data contained in the City's sewer GIS database, and assess the adequacy of the data for collection system modeling and master planning. The assessment will include consideration of the completeness of each attribute (e.g., diameters, elevations, lengths), connectivity between pipes and manholes, inconsistencies in elevation datum, links to record drawings, missing sewers (backlogged projects not yet input to the GIS), and limitations that could affect the development of the model. The CONSULTANT shall review selected record drawings to determine their contents and accessibility for supplementing information in the GIS database if needed. The CONSULTANT shall also review existing City maintenance management systems and other sewer databases to determine their contents and accessibility, and to identify how those data may be useful in the study.

Work Product: *Listing of additional data requirements for inclusion in TM under Subtask 1.3.*

Subtask 1.3 - Prepare Technical Memorandum (TM) on Existing Information. The CONSULTANT will prepare a brief technical memorandum summarizing the information compiled and reviewed in Subtasks 1.1 and 1.2. The focus of the data summaries will be to identify critical data gaps, document and evaluate the format, accuracy, and completeness of the data for use in modeling and other project tasks, and identify the need for additional information, including surveying and sewer flow monitoring. The CONSULTANT will conduct a workshop with CITY staff to review the findings of the draft TM and to reach agreement on the primary data sources to be used in the study and on additional data collection activities to be performed.

Work Product: *TM on Existing Information.*

CLV Collection System Master Plan Update - Scope of Work

Task 2 - Additional Data Collection

The purpose of this task is to collect the additional data identified in Task 1 as a requirement for successful completion of the project.

Subtask 2.1 - Record Drawing Research. The CONSULTANT shall research the CITY's record drawings to obtain data required for modeling that is not currently included in the CITY's GIS. The scope of this task is limited to 40 hours.

Work Product: Data for inclusion in model.

Subtask 2.2 - Elevation Surveying. The CONSULTANT shall determine the ground and invert elevations at manholes to supplement GIS data and resolve datum consistency problems. A level of effort equivalent to ten (10) survey crew days is assumed for this subtask

Work Product: Manhole surveys and written recommendation on resolution of datum consistency problems.

Task 3 - Review and Update Land Use Planning Criteria

The purpose of this task is to define the basis of planning for determining future flows and trunk sewer needs for the CITY. Land use mapping and planning criteria will be developed from information available from the CITY'S planning department.

Subtask 3.1 - Define Existing and Future City Service Area. The CONSULTANT will obtain and update if necessary a map of the existing CITY service area. The existing CITY boundary will be shown on the GIS base map to be used for subsequent modeling tasks. The future CITY service area (the "study area" for this Master Plan) will be delineated based on areas of projected urban land uses within the CITY's planning areas.

Work Product: Map showing existing and future CITY service area boundaries.

Subtask 3.2 - Compile Information from Applicable Land Use Plans. The CONSULTANT will compile information from applicable land use documents that encompass the existing and future CITY service area. These documents will include population and housing information, water and transportation studies, and available development Master Plans. Specific plan and other planning area boundaries will be added to the digital mapping developed in previous tasks. Information on existing and future land uses categories, quantities, densities, locations, and timing will be organized for use in developing land use mapping and planning criteria for the Master Plan. Specific items or areas requiring further information will be identified for subsequent discussions with CITY planning staff.

CLV Collection System Master Plan Update - Scope of Work

Work Product: *Summaries of information contained in each planning document as related to the development of Master Plan Update planning criteria and mapping. Maps showing the boundaries of specific plans and other planning areas.*

Subtask 3.3 - Meet with City Planning Staff. Based on the information developed in Subtask 3.2, the CONSULTANT will hold a meeting with the CITY's Planning Department staff and other departments responsible for development planning (1 meeting assumed) to review the land use planning information and obtain additional information that may not be specifically contained in the published planning documents. Such information may include more specific information on near-term developments; anticipated growth rates and timing of development; area-specific residential densities; projected areas of re-development; potential future changes to planning boundaries; and potential future CITY annexations. An agenda will be prepared for the meeting, and CITY staff will be invited to suggest agenda items and attend the meeting.

Work Product: *Minutes of meetings with CITY planning staff.*

Subtask 3.4 - Refine Land Use Categories and Densities. Based on the information obtained in the previous subtasks, the CONSULTANT will develop a set of 12 to 16 consolidated land use categories to be used for the Master Plan Update. Each category will be assigned a range of densities, i.e., equivalent residential units (ERUs) per acre, and an average or "default" density. However, the master planning methodology will incorporate the ability to assign specific densities to certain areas to account for anticipated variations within the study area. The land use densities used for the Master Plan Update will represent the potential maximum buildout density in each area. In subsequent tasks, unit flow factors will be applied to each land use category to generate projected wastewater flows.

Work Product: *List of proposed Master Plan land use categories and densities.*

Subtask 3.5 - Develop Digital Mapping of Future Land Uses. Based on the information obtained in the previous subtasks, the CONSULTANT will identify areas of future development, redevelopment, and infill and their associated land use categories. To facilitate the development of this information, the study area will be divided into individual planning areas based on a combination of planning boundaries (e.g., City boundaries) and major trunk sewershed boundaries. These planning areas will be used to define area-specific densities and development timing. The CONSULTANT will use the CITY's digital land use map as the basis for mapping future land uses in the Master Plan Update study area. The digital map will be modified as necessary to incorporate additional detail for specific developments, city-specific land use information, and information on redevelopment and major infill areas. The mapping will use the land use categories developed in Subtask 3.4. The map will be developed in GIS format so that it can be processed with digital mapping of sewersheds (to be developed in subsequent tasks) to develop the land use breakdown by sewershed for calculation of wastewater flows.

Additional digital mapping will be obtained for the entire City based on one flight date. The coverage will include the potential service areas as well as the area designated "paiute lands" shown in the MP_Update_05-10-06.pdf figure, along with the coverage shown in the CLV future

CLV Collection System Master Plan Update - Scope of Work

land use map (clf-flu.pdf). Planimetric features will not be captured. Planimetric features will be illustrated on the digital raster orthophotographs.

Work Product: *GIS land use map for the City Master Plan Update (5-foot contours, 1"=400' mapping, 1.0' pixel for 1"=400', Flight and Photography scale: 1:19200/1600' PS). Color orthophotos and contours (AutoCad contours, TIFF digital Raster on DVD).*

Subtask 3.6 - Determine Development Timing. Through discussions with planning staff and developers, the CONSULTANT will identify the anticipated timing of development for specific portions of the study area and major developments. Separate layers on the digital land use map will be developed to delineate anticipated 2010, 2015, 2020, 2030, and development through 2055 to be used for defining growth scenarios for modeling and phasing of proposed capital improvement projects. The land use projections developed in this task will be compared to available population growth projections by the CITY and others.

Work Product: *Maps delineating 2010, 2015, 2020, 2030 and 2055 development horizons (5 planning horizons).*

Subtask 3.7 - Prepare Technical Memorandum on Land Use Planning Criteria. The CONSULTANT will prepare a TM summarizing the land use information and proposed land use planning criteria for the Master Plan Update as developed in Task 3. An initial draft TM will be prepared to serve as the basis for discussion and preparation of informational material for the workshop(s) to be conducted under Subtask 3.8. A final draft TM will be prepared to incorporate the input received at the workshop(s).

Work Product: *TM on Land Use Planning Criteria.*

Subtask 3.8 – Conduct Workshops on Land Use Planning Criteria. The CONSULTANT will prepare and participate in up to two half-day workshops to discuss and receive input into land use planning criteria for the Master Plan Update. The CONSULTANT will prepare informational and presentation materials for the workshops. The topics of discussion may include proposed buildout densities for different land use categories and areas of the CITY service area, and the anticipated timing and location of developments. Based on the input received at the workshops, the proposed land use planning criteria will be refined and incorporated into the final draft TM as described under Subtask 3.7.

Work Product: *Workshop informational and presentation materials; workshop minutes.*

Task 4 - Review and Update Model Calibration Flow Criteria

The purpose of this task is to review and update the model calibration design flow criteria used for sizing CITY sewer facilities. Based on analysis of flow monitoring data, flow parameters will be developed for ERU unit flow rates, and diurnal wastewater variations. The flow parameters will be used in modeling of the CITY sewer system and for updating the CITY flow criteria.

CLV Collection System Master Plan Update - Scope of Work

Subtask 4.1 - Review Existing Flow Monitoring Data. The CONSULTANT will review the historical flow and rainfall data collected by the CITY over the past three years. Specifically, the CONSULTANT will identify previous flow monitoring sites, time periods of flow monitoring, and review the data plots. The CONSULTANT will also discuss the hydraulic conditions at the various sites with CITY staff who have been involved in the field work. The purpose of this review will be to identify sites that can be used for model calibration and sites that will provide data to verify ERU unit flows and dry weather diurnal patterns for representative areas of the CITY sewer system. The review will assess the need for additional field data collection, including flow monitoring to verify the calibration of existing and previous meter sites and, if necessary, adjust the historical meter data.

***Work Product:** List and map of historical flow monitoring sites, periods of monitoring, and relative quality of data. Identification of priority flow monitoring sites for model calibration and development of design flow parameters.*

Subtask 4.2 - Develop Plan for Supplemental Calibration and Flow Monitoring. Based on the review of historical data and assessment of flow data needs for the Master Plan Update effort, the CONSULTANT will develop a plan for supplemental calibration and flow and rainfall monitoring. The plan will identify proposed meter sites, purpose of monitoring (verification of historical data or collection of additional data), proposed monitoring schedule, field equipment, and procedures. It is anticipated that the program will include a combination of Subconsultant-installed flow meters (up to 20) and existing or relocated CITY meters. The CONSULTANT will coordinate the development of the plan with CITY staff.

***Work Product:** Flow Monitoring Plan.*

Subtask 4.3 - Conduct Flow Monitoring and Meter Calibration. After review and approval of the flow monitoring plan by the CITY, the CONSULTANT, through its Subconsultant, will conduct a site reconnaissance of the proposed flow monitoring sites to verify hydraulic suitability and assess safety, access, and traffic issues. Any changes to the proposed sites will be submitted to the CITY for approval. The CONSULTANT will install, calibrate, maintain, and remove the specified flow meters. Flow meters will be checked and interrogated weekly, and field calibration data (independent measurements of flow depth and velocity) will be collected for a range of flow depths at different times during the monitoring period. For purposes of developing the estimated level of effort and cost for this work, it is assumed that the CONSULTANT will provide and install 20 area-velocity flow meters for a period of 14 days. The field work will be conducted by the CONSULTANT's flow monitoring subconsultant, who will provide an experienced field crew trained in confined space entry and use of flow monitoring equipment. All field work will be coordinated with CITY staff and Operations and Maintenance personnel.

***Work Product:** Meter site reports, field calibration data, and electronic files of meter-recorded flow depth and velocity. Calibration curves for each meter site and electronic files and 7-day plots of flow depth, and calibrated flow rate.*

CLV Collection System Master Plan Update - Scope of Work

Subtask 4.4 - Analyze Flow Data and Develop Flow Parameters. The CONSULTANT will analyze the flow data collected under Subtask 4.3 and previous data for selected historical sites (adjusted as necessary based on the field calibration). The objectives of the analysis will be to quantify dry weather flows, verify ERU unit flow factors (ERUs for each monitored area will be developed based on the sewershed delineation and ERU quantification in Task 6), and develop representative diurnal wastewater profiles (hourly dry weather flow variations) to develop preliminary parameters required for modeling.

***Work Product:** Tabulation of average, minimum, and peak flow rates for each monitor site; estimates of base wastewater flow, groundwater infiltration; and representative diurnal curves.*

Subtask 4.5 - Prepare Technical Memorandum on Model Calibration Flow Criteria. The CONSULTANT will prepare a TM summarizing the results of the flow monitoring and data analyses and presenting the proposed design flow criteria for the Master Plan Update. The TM will also discuss allowances for infiltration/inflow; and the potential for future changes in wastewater flow rates as a result of water conservation practices, new construction methods, and sewer system rehabilitation.

***Work Product:** TM on Model Calibration Flow Criteria.*

Subtask 4.6 - Conduct Workshop and Finalize Design Flow Criteria. The CONSULTANT will lead a workshop to review and discuss the proposed CITY design flow criteria. Based on the discussions at the workshop, the proposed design flow criteria may be adjusted. If substantial changes are made, the Design Flow Criteria TM will be revised and resubmitted for review by the CITY.

***Work Product:** Workshop meeting minutes; revised TM on Design Flow Criteria (if required).*

Task 5 - Evaluate Hydraulic Modeling Software

The purpose of this task is to identify and evaluate hydraulic modeling software options for the Master Plan Update and for subsequent use by CITY staff. The CITY will purchase the necessary licenses once the modeling software has been selected.

Subtask 5.1 - Identify Modeling Needs and Establish Model Evaluation Criteria. In conjunction with CITY staff, the CONSULTANT will define the data and functionality required for the hydraulic model and establish the criteria to be used for evaluating model options. The criteria will address such issues as required hydraulic capabilities and accuracy; flow generation, GIS compatibility; hardware and operating system requirements; user interface capabilities; cost; and required technical support.

***Work Product:** Model evaluation criteria.*

CLV Collection System Master Plan Update - Scope of Work

Subtask 5.2 - Define Flow Computation Requirements. The CONSULTANT will develop the data and GIS requirements for flow computation based on the land use mapping and planning and design flow criteria developed in previous tasks.

Work Product: *Documentation of flow computation requirements.*

Subtask 5.3 - Identify and Compare Model Software Options and Prepare Technical Memorandum. The CONSULTANT will evaluate and compare HYDRA, InfoSewer, InfoSWMM, and InfoWorks with respect to the criteria developed under Subtask 5.1 and the data and GIS interface requirements identified in Subtask 5.2. Comparisons will be based on published documentation on the models, discussions with other users (other agencies and consultants), and the project team's experience. Evaluation or demonstration software will be obtained and evaluated for each model with CITY input. The CONSULTANT will prepare a TM that discusses the features, advantages, and disadvantages of each model, and presents an evaluation with respect to the criteria and requirements established in Subtasks 5.1 and 5.2.

Work Product: *TM on Evaluation of Hydraulic Model Options*

Subtask 5.4 - Conduct Model Workshop; Select and Purchase Software. After CITY review of the model evaluation TM, a workshop will be held with staff to discuss the models. At this workshop, the CONSULTANT will demonstrate the features of the model software and have an in-depth discussion about hydraulic capabilities, user interface, how each model would interface with GIS, the cost of model software, and availability of technical support. The objective of the workshop will be to present and explain the various options so that CITY staff can make an informed decision on the selection of the best model for its use. Based on the workshop and TM, the CITY will select and separately purchase the desired model software.

Work Product: *Selected model software to be purchased for use by the CONSULTANT on the project and provided to the CITY at project completion.*

Task 6 - Construct and Verify Model of the Existing System

This task will include construction of the hydraulic model of the existing CITY sewer system, development of the model interface to GIS, and calibration and verification of the model using actual flow monitoring data.

Subtask 6.1 - Build Model Network and Database. The CONSULTANT will develop the data required to define the model network components (pipes and manholes) and connectivity. The basic source of data for the model network will come from the sewer system GIS files. The model network will be developed as a database linked to the sewer network in ArcGIS and will include all sewers 10-inch diameter or larger, selected 8-inch diameter sewers, and their associated manholes in the CITY system. In addition, pump stations and diversion structures located on the existing sewer system will be included in the model.

CLV Collection System Master Plan Update - Scope of Work

Work Product: *Data and GIS files of sewer pipes ($\geq 10''$ and selected $8''$) and manholes in format required for hydraulic model.*

Subtask 6.2 - Validate Network Data; Identify Survey Needs. The CONSULTANT will perform basic data checks for missing data and physical inconsistencies (e.g., reverse pipe slopes, significant discontinuities in pipe sizes or slopes, etc.). The validation will also check pipe connectivity using network trace routines. Based on the results of the data validation, the CONSULTANT will identify needs for additional verification to be conducted under Task 17.

Work Product: *Corrected model network data files; list of field verification needs.*

Subtask 6.3 - Compile Pump Station Data. The CONSULTANT will compile the physical data required for modeling of CITY pump stations on the modeled sewer network. Such data includes wet well elevations and dimensions, pump on/off levels, pump capacities and head-discharge relationships. It is understood that most of this data will be provided by the CITY to the CONSULTANT. Missing elevation or dimension data that can be obtained through field measurements will be obtained under Subtask 2.2. Additional information required for modeling, such as current operational control strategies, will be obtained through discussions with CITY staff. No field testing of pump performance or operation will be conducted for this subtask.

Work Product: *Pump station data and pump curves.*

Subtask 6.4 - Develop Flow Generation Program. The CONSULTANT shall create a program that runs within the ArcGIS software to process information from appropriate CITY databases (e.g., parcels, land use, population, employment) to produce the required information at the sewershed level to drive the flow generation routine of the selected modeling software. The program will be capable of processing information for both existing and future flows.

Work Product: *A custom ArcGIS program to generate flows.*

Subtask 6.5 - Define Existing Sewersheds and Flows. The CONSULTANT will delineate sewersheds for modeling of the existing trunk sewer network. A sewershed represents an area of the collection system for which the flow can be assumed to be tributary to a single "load point" in the trunk sewer network. It is anticipated that the sewersheds will closely follow those previously established for the 1994 Wastewater Collection System Master Plan. The sewershed boundaries will be digitized as a GIS layer. Each sewershed will be identified by a sewershed designation, the number of its load manhole, and its flow contributing acreage. Using the sewershed boundaries and ERU data associated with parcels connected to the sewer system, the CONSULTANT will develop flow inputs to the model for existing conditions. In addition to the ERU data, input data for flow calculations will include sewershed acreages and associated parameters, as developed under Task 4.

Work Product: *Digital map of existing sewersheds; sewershed ERUs and flow parameters for input to hydraulic model.*

CLV Collection System Master Plan Update - Scope of Work

Subtask 6.6 - Calibrate and Verify Model for Existing Conditions. The final step in the construction of the existing system model is model calibration and verification. Model calibration involves comparing model simulations with actual flow monitoring data. The CONSULTANT will calibrate the sewer system hydraulic model for dry weather conditions. Calibration to dry weather flows will be used to refine dry weather unit flow factors, diurnal curves and infiltration rates. Additional confirmation of model results will be obtained by verifying identified problem areas (e.g., surcharge conditions during wet weather events, pump station overloads, etc.) with sewer system operations personnel.

Work Product: Model output for calibration simulations.

Subtask 6.7 - Prepare Technical Memorandum on Model Development. The CONSULTANT will prepare a TM documenting the development of the hydraulic model, data files, and GIS interface. The TM will also describe the model calibration process and results.

Work Product: TM on Model Development.

Task 7 - Develop Future Flows and Sewersheds

This task will define the overall sewer drainage and system configuration for the currently undeveloped areas of the CITY service area. This task will be conducted in parallel with the development of the existing system model (Task 6), resulting in a consolidated model that will then be used for the hydraulic analyses and development of the Master Plan Update projects in subsequent tasks.

Subtask 7.1 - Develop Mapping for Undeveloped Areas and Define Future Sewersheds. The CONSULTANT will develop mapping to define future sewershed boundaries. The CITY's GIS land use map, parcel base map, and digital mapping developed under Task 3.5 will be used for this purpose. Sewersheds will be defined in a logical manner to reflect natural drainage as well as likely patterns of development. Sewersheds will be delineated in sufficient detail to develop the layout of future trunk sewers down to 10-inch diameter. A preliminary verification will be made that all areas within the proposed sewersheds can be served by 8-inch collector mains with sufficient cover. This will be further verified by more detailed project development in Task 11.

Work Product: Digital mapping showing future sewersheds.

Subtask 7.2 - Define Trunk System Configuration for Undeveloped Areas. The CONSULTANT will develop a preliminary layout of trunk sewers to serve undeveloped areas. The existing interceptor system and the basic trunk sewer configuration will serve as the starting point for developing the future trunk system. Preliminary trunk sewer layouts developed for specific plan sewer studies and other development projects will also be considered. Once the trunk sewer configuration has been defined on a preliminary basis, these alignments will be digitized as GIS layers to be used for modeling of the future system.

CLV Collection System Master Plan Update - Scope of Work

Work Product: *Preliminary trunk sewer system configuration for undeveloped areas.*

Subtask 7.3 - Develop Input Flows for Future Growth Scenarios. The CONSULTANT will develop future flows for the model by overlaying the digital land use and development phasing layers developed in Task 3 on the future sewershed map. The design flow criteria developed in Task 4 will be used to compute sewershed flows. The impact of the following development scenarios will be considered in developing future flow rates:

- Development north of Moccasin Road and future annexation areas;
- Development of Floyd Lamb Park property;
- Incorporation of land use densities identified in the Joint Land Use Plan;
- Impact of additional 9,750 residential units from amendment to Summerlin West Development Agreement;
- Impact of potential interagency agreement for sewer services for the Paiute Indian Reservation;
- Impact of Kyle Canyon Gateway development;
- Impact of additional high rise development trend in the downtown area (approximately 15,345 residential units);
- Diversion of flow to the Desert Breeze WRC;
- Impact of City of North Las Vegas wastewater flows.

Work Product: *Projected wastewater flows for future sewersheds.*

Subtask 7.4 - Prepare TM on Projected Wastewater Flows. The CONSULTANT will prepare a TM documenting the development of future sewersheds and projected wastewater flows.

Work Product: *TM on Projected Wastewater Flows.*

Task 8 - Perform Hydraulic Analysis and Identify Deficiencies of Existing System

In this task, the hydraulic model will be used to identify deficiencies in the existing system under existing flows and future growth scenarios and to refine the sizing of future trunk sewers. The model results will form the basis for identifying the need for system improvements, which will be developed in detail in Task 11.

Subtask 8.1 - Conduct Model Simulations. The CONSULTANT will conduct model simulations of the existing trunk sewer system and the preliminary future trunk sewer network developed in Task 7. Model runs will be conducted for dry weather conditions for existing (2005), 2010, 2015, 2020, 2030, and buildout (2055) growth scenarios (6 scenarios).

CLV Collection System Master Plan Update - Scope of Work

Work Product: Output from model runs.

Subtask 8.2 - Identify System Deficiencies for Existing and Future Conditions. In conjunction with CITY staff, the CONSULTANT will define criteria for identifying deficiencies in existing sewers. The criteria will likely be based on an allowable depth of flow to diameter ratio (d/D) or percentage of full pipe capacity under peak flow conditions based on pipe diameter. Deficiency criteria will also be established for pump stations. Using the established criteria, the deficiencies in the existing sewer system under each of the modeled growth scenarios will be identified through review of model output. Thematic maps created in GIS based on the model results will be generated to present these results graphically.

Work Product: Lists and color coded maps showing sewers and pump stations with capacity deficiencies.

Subtask 8.3 - Prepare TM on Model Results. The CONSULTANT will prepare a TM summarizing the results of the model simulations and the identified system deficiencies.

Work Product: TM on Model Results and Capacity Deficiencies.

Task 9 - Review and Refine Facility Design and Cost Criteria

This task will define the design and cost criteria to be used for sizing and estimating the construction costs of relief sewer facilities and proposed future trunk sewers.

Subtask 9.1 - Develop Master Plan Update Design Criteria. The CONSULTANT will review the current CITY design standards, and other trunk sewer design reports prepared during the past five years. The CONSULTANT will also review trenchless construction methods for trunk sewer replacement and new construction and propose guidelines for construction method selection, specifically targeted at trunk sewers. The review of potential construction methods will consider expected useful life and other factors that affect life cycle costs. Based on these reviews and discussions with CITY staff, the CONSULTANT will propose design criteria for use in developing trunk sewer improvement projects for the CITY Master Plan Update. The criteria will address applicable trenchless methods such as pipe bursting and microtunneling; as well as hydraulic criteria such as minimum and maximum velocities, manning coefficient, and allowable d/D ratio.

Criteria for force mains will also be defined. These will include force main design considerations, and maximum force main velocities.

Work Product: Proposed design criteria for Master Plan Update projects.

Subtask 9.2 - Develop Master Plan Update Cost Criteria. The CONSULTANT will review construction bids from trunk sewer and pump station projects constructed by the CITY and other recent construction bids in the Las Vegas valley, where available. Unit construction costs will be

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developed for components of sewer construction, including pipe and manhole installation, sheeting and shoring, dewatering, pavement removal and replacement, and traffic control; as well as for pump stations. The cost allowance traditionally included for engineering design, construction inspection, and legal costs will also be evaluated, as well as costs for other contributors to sewer construction costs, including environmental mitigation, coordination with other agencies, and easement and right-of-way acquisition.

Work Product: *Proposed unit costs and cost allowances for construction of trunk sewers and pump stations.*

Subtask 9.3 - Prepare TM on Design and Cost Criteria. The CONSULTANT will prepare a TM summarizing the proposed design and cost criteria for the Master Plan Update.

Work Product: *TM on Design and Cost Criteria.*

Task 10 - Review and Evaluate WRF Sites

This task will evaluate the water reclamation facility sites as they relate to their impact on the overall wastewater collection system, and provide alternative operational scenarios.

Subtask 10.1 – Evaluation of Existing/Future Water Reclamation Facilities (WRF). The CONSULTANT will conduct a planning level assessment of the impact of flows from the Durango Hills Water Reclamation Center (WRC), the Desert Breeze WRC, Bonanza-Mohave WRF, and future WRF sites already identified (e.g. Decatur site), or sites that may be proposed during the course of the project. The potential benefits of rerouting sewers to the Durango Hills WRC to utilize its full capacity will also be evaluated. The evaluation will take into consideration the impact on removal or addition of the WRF discharges from the collection system. Consideration will also be given to discharging some of the WRF flows to the Las Vegas Wash for sewer relief. Up to three alternative operational scenarios will be prepared.

The CONSULTANT will also coordinate work of this Task with the Facility Plan work being conducted by others. The CITY will provide information from the Facility Plan project.

Work Product: *Alternative operational scenarios.*

Subtask 10.2 - Develop Cost Estimates. The CONSULTANT will develop preliminary opinions of probable construction costs for the recommended improvements to the collection system infrastructure for comparison purposes. The estimates will be based on the cost criteria developed in Task 9 and will be presented in May 2007 dollars. It is understood that the opinions of cost will be considered conceptual planning level estimates with a Class 4 level of accuracy (minus 30 percent to plus 50 percent of actual project cost). This level of estimate is considered appropriate for system master planning and represents a “reconnaissance grade” cost opinion as specified by the Association for the Advancement of Cost Engineering International.

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***Work Product:** Planning level estimates of probable construction costs and capital costs for recommended satellite facility improvement projects and infrastructure cost impacts.*

Subtask 10.3 - Prepare TM on Evaluation of WRF Sites. The CONSULTANT will prepare a TM documenting the evaluation of the WRF sites, the impact of their flows on the collection system, and operational alternatives.

***Work Product:** TM on WRF Sites Evaluations.*

Task 11 - Develop Wastewater Facilities Expansion Projects

A major effort of the Wastewater Collection System Master Plan Update will be the development of recommended trunk sewer expansion projects for 2010, 2015, 2020, 2030 and 2055 planning horizons (5 planning horizons).

The project development work will be conducted as two major parallel efforts: development of expansion projects for undeveloped sewersheds (Task 11) and development of improvement projects (relief or replacement) for existing trunk sewers or pump stations (Task 12).

Subtask 11.1 - Develop Methodology and Procedures for Expansion Project Development. The CONSULTANT will develop a project development methodology and procedures “manual” to ensure that the same process is followed for development of expansion projects for all sewersheds. The procedures manual will likely be formulated as a prototype Sewershed Plan with specific instructions for each step of the process, including delineation of trunk sewershed boundaries, configuring the trunk sewer system, calculating wastewater flows, sizing sewers, defining right-of-way requirements, and estimating construction costs.

***Work Product:** Project development procedures and prototype Trunk Sewershed Plan.*

Subtask 11.2 - Review and Develop Project Alternatives. The CONSULTANT will develop project alternatives for alignments of new trunk sewers required to serve future development. Criterium Decision Plus™ (CDP) will be used as part of the alternatives evaluation process. The potential of combining CITY and CCWRD parallel sewers will be considered. The preliminary trunk sewer configuration developed in Task 7 and the boundaries of sub-trunk sheds (serving individual 12-inch sewers) will be refined. At the master planning level, the alignment of proposed trunks will be largely conceptual, but preference will be given to selecting alignments along existing roads or future roads identified in land use planning documents. Other alignment issues such as railroad, freeway, and creek crossings, potential major utility conflicts, wetland areas, and availability of right-of-way, will also be considered. The necessity for pump stations will also be determined, and alternative sites (or gravity sewer alternatives) will be identified. The CONSULTANT will also develop alternatives for interim trunk system facilities if needed to accommodate interim levels or areas of development prior to construction of permanent facilities. Required interim facilities will be identified based on the development growth and flow projections developed in previous tasks. Rough estimates of probable construction costs will be developed for the alternatives for purposes of alternative comparison and discussion. In

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order to address uncertainties with regard to cost, schedule, permitting, and other parameters the Crystal Ball™ software tool will be utilized.

Work Product: *Maps showing project alternatives for new trunk sewers and interim facilities in undeveloped areas.*

Subtask 11.3 - Conduct Supplemental Surveying or Topographic Research. The CONSULTANT will identify critical alignment issues (potential “fatal flaws”) which may warrant field surveying or research into the availability of other topographic data sources to supplement the data available on USGS and Clark County maps. The CONSULTANT will conduct field surveying and/or research as necessary to obtain this data. A level of effort equivalent to ten (10) survey crew days is assumed for this subtask.

Work Product: *List of critical locations requiring field survey; survey results.*

Subtask 11.4 - Conduct Workshops on Proposed Projects. The CONSULTANT will conduct up to 2 half-day workshops to discuss proposed project alternatives for trunk system expansion. The workshops will be attended by key CITY staff members and other interested parties as requested by the CITY (e.g., other County staff, CITY representatives, developer’s engineers, etc.). Each workshop will focus on a specific geographic portion of the CITY service area. At the workshops, the CONSULTANT will present and discuss the proposed project alternatives and solicit input from the workshop participants. Other project issues, such as project prioritization and phasing, could also be addressed at these workshops. The CONSULTANT will prepare agenda and meeting minutes for each workshop.

Work Product: *Workshop materials, agendas, and minutes.*

Subtask 11.5 - Refine Projects and Recommended Alignments. The CONSULTANT will incorporate input received at the project workshops into the final recommended trunk sewer project alignments and facilities. Digital mapping will be developed for the Trunk Sewershed Plans (approximate scale of 1 inch = 1,600 feet). The maps will show the final trunk shed and sewershed boundaries, proposed pipeline alignments, slopes, and approximate rim and invert elevations at key junction points; and locations and sizes of interim facilities, if needed.

Work Product: *Digital mapping of recommended trunk sewer projects; quantity estimates for use in cost estimating.*

Subtask 11.6 - Run Model to Confirm Projects. The CONSULTANT will incorporate the recommended trunk sewer alignments into the hydraulic model and run the model to confirm the proposed projects. The modeling will also confirm and refine the downstream flows in the existing CITY trunk system and identify any additional capacity issues that need to be addressed in Task 11, as well as identify the timing requirements for interim versus permanent trunk sewer facilities.

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Work Product: *Updated GIS and model data files for proposed future trunk sewers; model output; flow "triggers" for interim and permanent facility construction.*

Subtask 11.7 - Develop Cost Estimates. The CONSULTANT will develop preliminary opinions of probable construction costs and estimated capital costs for the recommended trunk sewer expansion projects. The estimates will be based on the cost criteria developed in Task 9 and will be presented in September 2007 dollars. It is understood that the opinions of cost will be considered conceptual planning level estimates with a Class 4 level of accuracy (minus 30 percent to plus 50 percent of actual project cost). This level of estimate is considered appropriate for system master planning and represents a "reconnaissance grade" cost opinion as specified by the Association for the Advancement of Cost Engineering International.

Work Product: *Planning level estimates of probable construction costs and capital costs for recommended trunk sewer expansion projects.*

Subtask 11.8 - Prepare TM on Recommended Projects. The CONSULTANT will prepare a TM summarizing the results of the trunk sewer expansion project development task and presenting the recommended projects. The TM will include the draft Trunk Sewershed Plans, including trunk sewershed maps, project descriptions (alignment, pipe sizes, design flows), the specific developments or areas intended to be served by each project, project cost estimates, and estimated project durations.

Work Product: *TM on Recommended Trunk Sewer Expansion Projects.*

Task 12 - Develop Improvement Projects for the Existing Trunk Sewer System

This task will parallel Task 11, focusing on development of improvement projects within the existing CITY system that are required to correct existing or projected capacity deficiencies as identified by the modeling conducted in Task 8.

Subtask 12.1 - Review and Develop Alternatives for Trunk Sewer Relief Projects

Projects for correcting identified system deficiencies under existing and future flows were developed in the 1994 Wastewater Collection System Master Plan. The CONSULTANT will review these projects to determine whether or not they are still valid solutions to the deficiencies identified in the updated modeling. The CONSULTANT will develop additional alternatives as required to address capacity deficiencies identified in the updated modeling, including those for smaller diameter sewers that were included in the modeling effort. Criterium Decision Plus™ (CDP) will be used a part of the alternatives evaluation process. For capacity deficiencies in existing trunk sewers, alternatives may include replacement or paralleling of existing deficient trunk sewers, diversions to other trunks, and/or construction of new sewers along different alignments. The CONSULTANT will also review the work from the Unlined RCP Sewer Evaluation and Rehabilitation projects to determine if rehabilitation needs identified through the condition assessments may dictate alternative solutions to capacity problems in trunk sewers that

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are in need of structural rehabilitation. In order to address uncertainties with regard to cost, schedule, permitting, and other parameters the Crystal Ball™ software tool will be utilized.

Work Product: *Maps showing alternatives for trunk sewer relief projects.*

Subtask 12.2 - Develop Pump Station Improvement Alternatives. The CONSULTANT will develop alternatives for correcting projected pump station deficiencies at the Lone Mountain Pump Station, if identified by the hydraulic modeling. Alternatives for pump station improvements may include pump station expansions, diversions to gravity sewers so that the CITY develops a complete gravity system, or new pump station sites.

Work Product: *Pump station improvement alternatives.*

Subtask 12.3 - Research Traffic Corridors and Potential Utility Conflicts. For relief sewer projects of significant size (diameter and/or length) or located in major traffic or utility corridors, the CONSULTANT will research potential utility conflicts (all storm drains plus other utilities 12 inches and larger in diameter) and identify projected road improvement work and traffic issues through discussions with CITY, County, and utility agency staff. The focus in this effort will be on identifying potential fatal flaws or significant constructability issues with regard to pipeline alignments. Information gathered in this subtask will be recorded on the mapping developed in Subtask 12.1.

Work Product: *Information and maps showing potential utility conflicts and roadway and traffic issues.*

Subtask 12.4 - Conduct Supplemental Surveying. The CONSULTANT will identify critical alignment issues (potential “fatal flaws”) which may warrant field surveying to supplement the topographic data available on USGS maps and other published mapping. The CONSULTANT will conduct field surveying as necessary to obtain this data. A level of effort equivalent to ten (10) survey crew days is assumed for this subtask.

Work Product: *List of critical locations requiring field survey; survey results.*

Subtask 12.5 - Run Hydraulic Model to Analyze Alternatives. The CONSULTANT will use the hydraulic model to analyze the flows in the system under the various relief sewer alternatives. The modeling will be used primarily to assess the downstream impacts of potential diversions and upsizing of existing trunk sewers and pump stations.

Work Product: *Model results for relief project alternatives.*

Subtask 12.6 - Conduct Workshops on Proposed Relief Projects. The CONSULTANT will conduct up to 2 half-day workshops to discuss proposed alternatives for relief sewer and pump station improvements. The workshops will be attended by key CITY staff members and other interested parties as requested by the CITY (e.g., other County staff, city representatives, etc.). At the workshops, the CONSULTANT will present and discuss the proposed project alternatives

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and solicit input from the workshop participants. The CONSULTANT will prepare agenda and meeting minutes for each workshop.

Work Product: *Workshop materials, agendas, and minutes.*

Subtask 12.7 - Refine Projects and Recommended Alignments. The CONSULTANT will incorporate input received at the project workshops into the final recommended trunk system relief projects. Conceptual site layouts will be prepared for pump station projects as needed. Quantity takeoffs for project facilities will be developed for use in preparing preliminary opinions of probable construction costs.

Work Product: *Mapping of recommended relief sewer projects in ArcGIS format; quantity estimates for use in cost estimating.*

Subtask 12.8 - Develop Cost Estimates. The CONSULTANT will develop preliminary opinions of probable construction costs and estimated capital costs for the recommended relief trunk sewer and pump station projects. The estimates will be based on the cost criteria developed in Task 9 and will be presented in September 2007 dollars. It is understood that the opinions of cost will be considered conceptual planning level estimates with a Class 4 level of accuracy (minus 30 percent to plus 50 percent of actual project cost). This level of estimate is considered appropriate for system master planning and represents a "reconnaissance grade" cost opinion as specified by the Association for the Advancement of Cost Engineering International.

Work Product: *Planning level opinions of probable construction costs and capital costs for recommended trunk relief sewer and pump station projects.*

Subtask 12.9 - Prepare TM on Recommended Projects. The CONSULTANT will prepare a TM summarizing the results of the existing trunk system improvement projects development task and presenting the recommended projects. The TM will include maps showing the project alignments and locations, project descriptions (alignment, pipe sizes, design flows), the specific deficiencies to be corrected by each project, project cost estimates, and estimated project durations. The information on relief sewer projects will also be packaged as trunk sewershed plans.

Work Product: *TM on Recommended Improvement Projects for the Existing Trunk Sewer System.*

Task 13 - Develop Capital Improvement Program (CIP)

The previous tasks developed a list of projects, their durations, and costs. The next step in program development is to develop a capital improvement program for these projects.

Subtask 13.1 – Prioritize and Schedule Capital Improvement Projects. The CIP consists of projects (and related capital costs) scheduled out over time. From a timing standpoint, projects will fall into two categories: (1) those related to existing problems within the existing sewer

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system, and (2) those needed to serve new development (most of which will involve projects outside of the existing system, but some of which will fall within the existing system). The CONSULTANT will develop a methodology for prioritizing these projects and develop a preliminary schedule for the CIP projects. CONSULTANT will coordinate CIP recommendations with those recommendations developed by the CITY under their Unlined RCP Sewer Evaluation and Rehabilitation projects. The first category of projects will be prioritized based on the severity of the problem and its potential impact on CITY customers. Projects in the second category will be phased based on the anticipated timing of new development. Meetings will be held with CITY staff to review and refine the preliminary phasing plan.

Work Product: *Preliminary priorities and schedule for CIP projects.*

Subtask 13.2 – Conduct Workshops on Proposed Project Phasing. The CONSULTANT will participate in one half-day workshop to discuss the proposed criteria for project prioritization and phasing. The workshop will discuss the methodology proposed for project prioritization and phasing and present a preliminary phasing plan. Input on the plan will be solicited from CITY staff. Based on input received at the workshop as well as input from the TRC, a proposed CIP schedule will be developed. The CONSULTANT will prepare agenda, presentation materials, and minutes for the workshop.

Work Product: *Workshop agenda, presentation materials, and minutes; CIP schedule.*

Subtask 13.3 - Develop CIP. The CONSULTANT will develop the 2010, 2015, 2020, 2030, and 2055 CIPs in the following steps:

1. Create an automated Excel spreadsheet containing a list of project costs, durations, and start dates. This spreadsheet will spread costs over time to create a CIP. This may be based on one or a combination of several methods, including a uniform distribution over the project duration or a “bell-shaped” or other defined distribution.
2. Using information gathered during the previous tasks, develop a preliminary CIP.
3. Meet with CITY staff to review and refine the CIP.

Work Product: *CIP spreadsheet; electronic file of CIP spreadsheet to be provided to CITY staff for future planning efforts.*

Subtask 13.4 - Prepare TM on Recommended CIP. The CONSULTANT will prepare a TM describing the CIP development methodology and presenting the recommended CIP.

Work Product: *TM on Recommended CIP.*

Task 14 - Prepare Master Plan Update Report

The Master Plan Update report will summarize and present the results and recommendations of the CITY Collection System Master Plan Update.

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Subtask 14.1 - Prepare Draft Master Plan Update Report and Executive Summary. The CONSULTANT will prepare a draft report summarizing the work completed in the Master Plan Update study and presenting the results and recommendations of the study tasks. The CONSULTANT will submit a detailed outline of the report for review by CITY staff. It is anticipated that report sections will correspond roughly to the tasks in the Scope of Work, and that the TMs will form the basis for relevant report sections as well as be included in the report appendix. The report will be a multi-volume document, with the main volume presenting planning and design criteria, summarizing the recommended projects, and presenting the overall phasing, budgets, and implementation plan. The detailed individual Trunk Sewershed Plans will be included in a separate volume. The CONSULTANT will also prepare a draft Executive Summary report (approximately 20 pages in length, including tables and figures) targeted for City Management and Council members.

***Work Product:** Report outline; draft Master Plan Update Report (10 copies of main volume; 3 copies of appendices and trunk sewershed plan volumes); draft Executive Summary report (10 copies).*

Subtask 14.2 - Prepare Final Master Plan Update Report and Executive Summary. The CONSULTANT will review and incorporate CITY comments on the draft Master Plan Update Report and Executive Summary. The final reports will be submitted within four weeks after receipt of written comments from the CITY. The CONSULTANT will also provide an electronic copy of the Report in Adobe pdf format.

***Work Product:** Final Master Plan Update Report (20 copies of main volume; 10 copies of appendices and trunk sewershed plan volumes); final Executive Summary report (20 copies); an electronic copy of the Master Plan Update Report and Executive Summary (pdf format).*

Task 15 - Model Installation and Training

At the conclusion of the study, the hydraulic model will be installed on the CITY's computer network and training provided to CITY staff (up to 4 people) on the use of the model and GIS interface.

Subtask 15.1 - Develop Model Documentation. The CONSULTANT will prepare user documentation to supplement the published reference manuals provided with the model software. The additional documentation will describe specifically how the model is set up and used for the CITY. User documentation will also be provided for the customized portion of the model-GIS interface.

***Work Product:** User documentation for model and GIS interface.*

Subtask 15.2 - Assist in Model Installation. The CONSULTANT will provide the model software and related files to the CITY and assist CITY staff in installing the model software, GIS interface, and model data and GIS files on the CITY's computer network. The CONSULTANT will test out the model and GIS interface to ensure that they are working properly.

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Work Product: *Working model of CITY system with GIS interface and associated files.*

Subtask 15.3 - Provide Model Training. The CONSULTANT shall train CITY staff on use of the sewer model. Training will consist of a half-day model overview session for all interested CITY staff, two 2-day formal hands-on training sessions for up to four CITY modeling staff, and 60 hours of informal training to be used at the CITY's discretion. It is expected that the formal and informal training sessions will occur throughout the course of the study.

Work Product: *Model tutorials and training materials.*

Task 16 - Project Management and Coordination

This task will include project monitoring and administration, attendance at regularly scheduled progress meetings with CITY staff and the project Technical Review Committee, and project quality assurance/quality control (QA/QC) activities. The scope of this task assumes a 22-month project schedule.

Subtask 16.1 - Prepare Project Work Plan and Conduct Kickoff Meeting. The CONSULTANT will prepare a project work plan for distribution to all CONSULTANT and CITY project team members. The work plan will include the project scope, schedule, and deliverables; identify team member roles, responsibilities, and lines of communication; and list the members of the project user groups and Technical Review Committee with addresses, telephone numbers, and email addresses. The CONSULTANT will conduct a project kickoff meeting with CITY staff to review the draft work plan. The final work plan will be distributed to team members following the kickoff meeting. Updates to the schedule and any revisions to the work plan will be provided to team members during the course of the project.

Work Product: *Project Work Plan, kickoff meeting agenda and minutes.*

Subtask 16.2 - Project Monitoring, Administration, and Status Reporting. The CONSULTANT will establish internal project controls to monitor project status, budget, staffing, and schedule on an on-going basis. Budget and schedule status will be reviewed weekly. The CONSULTANT will prepare monthly status reports within 5 working days after the close of the CONSULTANT's accounting month. The status reports will describe the work completed during the previous month, anticipated work for the following month, current budget and schedule status, and any project issues requiring discussion or resolution. This subtask also includes preparation of monthly invoices to the CITY and execution and administration of subconsultant contracts.

Work Product: *Budget and schedule updates, monthly status reports, monthly invoices.*

Subtask 16.3 – Project Status Meetings. The CONSULTANT will meet with CITY staff on the average of once every two weeks to review project status and discuss project issues. If needed, informal meeting minutes (bulleted format) will be prepared to document key

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information items or decisions made. A total of 44 project status meetings over the duration of the project are assumed.

Work Product: *Meeting minutes as required.*

Subtask 16.4 - Project QA/QC Activities. The CONSULTANT will perform internal QA/QC activities to obtain expert guidance on project methodology, review project deliverables, and perform checks of engineering calculations and cost estimates. The CONSULTANT will form an internal technical review committee (TRC) composed of 2 to 3 senior level engineers experienced in sewer master planning, modeling and design. These team members will review project deliverables and provide input on technical issues. The technical review team will meet formally at least two times during the course of the project.

Work Product: *Minutes of technical review meetings; engineering calculation and cost estimate checks.*

Subtask 16.5 - Assist in City Council Presentation. The CONSULTANT will assist CITY staff preparing a presentation of the final Master Plan Update Report to the CITY Council. The CONSULTANT will prepare presentation materials and visual aids and assist in discussing technical issues, findings, and recommendations as requested by CITY staff.

Work Product: *Presentation materials.*

EXHIBIT "B"

ADDITIONAL SERVICES WASTEWATER COLLECTION SYSTEM MASTER PLAN UPDATE

Task 17 – Supplemental Services

Upon the request of the CITY, CONSULTANT shall provide additional engineering services that are not described herein. For any such work, CONSULTANT shall first furnish a written scope, cost estimate, and revised schedule that the CITY shall approve in writing before CONSULTANT may proceed with the work.

The CONSULTANT shall provide any or all of the following, in accordance with the rate schedule in Exhibit "D" when so requested in writing by the CITY:

Subtask 17.1 - Record Drawing Research. The CONSULTANT shall research the CITY's record drawings to obtain data required for modeling that is not currently included in the CITY's GIS. A level of effort equivalent to 100 hours is assumed for this subtask.

Task 17.2 - Elevation Surveying. The CONSULTANT shall determine the ground and invert elevations at manholes to supplement GIS data and resolve datum consistency problems. A level of effort equivalent to ten (10) survey crew days is assumed for this subtask.

Task 17.3 - Flow Monitors. CONSULTANT will provide and install 10 area-velocity flow meters for a period of 14 days.

Task 17.4 - Conduct Supplemental Surveying or Topographic Research. The CONSULTANT will conduct field surveying and/or research as necessary to obtain topographic data. A level of effort equivalent to ten (10) survey crew days is assumed for this subtask.

Task 17.5 – Meetings. CONSULTANT will participate in meetings with the following entities up to a level of effort not to exceed 262 labor hours:

- a) City of North Las Vegas;
- b) Bureau of Land Management (BLM);
- c) Paiute Indian Reservation;
- d) Public outreach meetings;
- e) Miscellaneous meetings, as appropriate.

Presentation material and meeting minutes and will be prepared, as appropriate.

Subtask 17.6 - Model Support. The CONSULTANT will provide 40 hours of support to CITY staff on the use of the model throughout the study. Support may include on-site visits to work directly with CITY staff and/or telephone consultation.

EXHIBIT C. MANHOUR ESTIMATES (STAFF TASK HOURLY BREAKDOWN)
Wastewater Collection System Master Plan Update

TASK DESCRIPTION	Technical Director	TRC Principal Engineer	Project Manager	Principal Engineer	Senior Engineer	Engineer	Associate Engineer	Clerical / Admin. Assistant	TOTAL LINE ITEM HOURS
1.0 Compile and Review Existing Information									
1.1 Compile, Organize, and Summarize Existing Documents and Data	4	0	2	16	8	12	38	8	88
1.2 Assess Sewer GIS Database	0	0	1	8	40	4	4	0	57
1.3 Prepare Technical Memorandum on Existing Information	4	0	4	16	16	4	4	0	43
Subtotal Task 1.0	8	0	7	40	64	20	48	8	183
2.0 Additional Data Collection									
2.1 Record Drawing Research	0	0	0	0	0	40	0	0	40
2.2 Elevation Surveying	0	0	1	8	0	0	18	0	25
Subtotal Task 2.0	0	0	1	8	0	40	18	0	65
3.0 Review and Update Land Use Planning Criteria									
3.1 Define Existing and Future City Service Area	8	0	2	4	0	4	4	0	22
3.2 Complete Information from Applicable Land Use Plans	0	0	0	8	16	12	12	0	48
3.3 Meet with City Planning Staff	8	0	8	8	0	0	0	0	24
3.4 Refine Land Use Categories and Densities	0	0	0	8	8	12	12	0	40
3.5 Develop Digital Mapping of Future Land Uses	0	0	0	8	8	20	20	0	56
3.6 Determine Development Timing	12	0	0	16	16	20	20	0	72
3.7 Prepare Technical Memorandum on Land Use Planning Criteria	16	0	4	24	16	12	12	0	80
3.8 Conduct Workshop on Land Use Planning Criteria	0	0	16	16	0	0	0	0	48
Subtotal Task 3.0	44	0	30	92	64	80	80	0	390
4.0 Review and Update Flow Criteria									
4.1 Review Existing Flow Monitoring Data	0	0	0	4	8	16	16	0	44
4.2 Develop Plan for Supplemental Calibration and Flow Monitoring	4	0	1	16	40	0	0	0	61
4.3 Conduct Flow Monitoring and Meter Calibration	0	0	0	4	4	0	0	0	8
4.4 Analyze Flow Data and Develop Flow Parameters	2	0	0	16	40	60	60	0	176
4.5 Prepare Technical Memorandum on Design Flow Criteria	4	0	4	16	8	4	4	0	38
4.6 Conduct Workshop and Finalize Design Flow Criteria	0	0	8	16	0	0	0	0	28
Subtotal Task 4.0	10	0	13	72	100	80	80	0	355
5.0 Evaluate Hydraulic Modeling Software									
5.1 Identify Modeling Needs and Establish Model Evaluation Criteria	0	0	0	16	0	0	0	0	16
5.2 Define Flow Computation Requirements	4	0	0	8	16	0	0	0	24
5.3 Identify and Compare Model Software Options and Prepare Technical Memorandum	4	0	4	16	0	20	20	0	64
5.4 Conduct Model Workshop; Select and Purchase Software	0	0	4	8	0	8	0	0	24
Subtotal Task 5.0	8	0	8	48	16	28	20	0	128
6.0 Construct and Verify Model of Existing System									
6.1 Build Model Network and Database	0	0	0	16	8	40	40	0	104
6.2 Validate Network Data; Identify Survey Needs	0	0	0	8	8	40	40	0	96
6.3 Compile Pump Station Data	0	0	0	2	0	10	10	0	22
6.4 Develop Flow Generation Program	0	0	0	8	40	0	0	0	48
6.5 Define Existing Sewersheds and Flows	0	0	0	16	8	42	44	0	110
6.6 Calibrate and Verify Model for Existing Conditions	8	0	0	16	40	60	60	0	216
6.7 Prepare Technical Memorandum on Model Development	0	0	4	16	40	4	4	0	76
Subtotal Task 6.0	8	0	4	82	144	218	218	0	672
7.0 Develop Future Flows and Sewersheds									
7.1 Develop Mapping for Undeveloped Areas and Define Future Sewersheds	0	0	0	8	0	40	40	0	88
7.2 Define Trunk System Configuration for Undeveloped Areas	8	0	0	8	0	52	54	0	122
7.3 Develop Input Flows for Future Growth Scenarios	8	0	0	8	16	20	20	0	72
7.4 Prepare Technical Memorandum on Projected Wastewater Flows	0	0	4	16	8	4	4	0	44
Subtotal Task 7.0	24	0	4	40	24	116	116	0	328
8.0 Perform Hydraulic Analysis and Identify Deficiencies									
8.1 Conduct Model Simulations	0	0	0	0	20	20	10	0	50
8.2 Identify System Deficiencies for Existing and Future Conditions	0	0	0	16	24	20	20	0	80
8.3 Prepare Technical Memorandum on Model Results	0	0	4	16	8	8	12	0	48
Subtotal Task 8.0	0	0	4	32	52	48	42	0	178
9.0 Review and Refine Facility Design and Cost Criteria									
9.1 Develop Master Plan Update Design Criteria	4	0	0	16	44	0	0	0	64
9.2 Develop Master Plan Update Cost Criteria	4	0	0	8	28	12	0	0	50
9.3 Prepare Technical Memorandum on Design and Cost Criteria	8	0	4	16	20	0	0	0	50
Subtotal Task 9.0	16	0	4	42	90	12	0	0	164
10.0 Review and Evaluate WRF Sites									
10.1 Evaluate Existing/Future Water Reclamation Facilities	0	0	10	24	12	20	8	0	74
10.2 Develop Cost Estimates	0	0	4	16	12	10	10	0	52
10.3 Prepare Technical Memorandum on Evaluation of WRF Sites	8	0	10	16	12	8	0	0	52

EXHIBIT C. MANHOOR ESTIMATES (STAFF TASK HOURLY BREAKDOWN)
Wastewater Collection System Master Plan Update

11.0	Develop Sewer Facilities Expansion Projects	Subtotal Task 10.0	8	0	24	56	36	18	0	178
11.1	Develop Methodology and Procedures for Expansion Project Development		8	0	0	16	24	0	0	0
11.2	Review and Develop Project Alternatives		8	0	4	40	48	20	0	88
11.3	Conduct Supplemental Surveying or Topographic Research		0	0	0	0	0	48	0	194
11.4	Conduct Workshops on Proposed Projects		4	0	8	12	12	0	0	8
11.5	Refine Projects and Recommended Alignments		0	0	0	24	24	0	0	36
11.6	Run Model to Confirm Projects		0	0	0	8	16	28	0	108
11.7	Develop Cost Estimates		12	0	4	8	16	20	0	64
11.8	Prepare Technical Memorandum on Recommended Projects		0	0	4	24	4	4	0	36
		Subtotal Task 11.0	32	0	20	132	180	148	0	656
12.0	Develop Improvement Projects for the Existing Trunk Sewer System									
12.1	Review and Develop Alternatives for Trunk Sewer Relief Projects		8	0	4	44	48	40	0	182
12.2	Develop Pump Station Improvement Alternatives		0	0	0	10	20	0	0	30
12.3	Research Traffic Corridors and Potential Utility Conflicts		0	0	0	8	40	8	0	84
12.4	Conduct Supplemental Surveying		0	0	0	0	0	8	0	8
12.5	Run Hydraulic Model to Analyze Alternatives		0	0	0	16	16	20	0	72
12.6	Conduct Workshops on Proposed Relief Projects		4	0	8	12	12	0	0	36
12.7	Refine Projects and Recommended Alignments		0	0	0	16	16	22	0	80
12.8	Develop Cost Estimates		0	0	4	8	16	4	0	36
12.9	Prepare Technical Memorandum on Recommended Projects		12	0	4	24	4	4	0	80
		Subtotal Task 12.0	24	0	20	138	216	120	0	656
13.0	Develop Capital Improvement Program									
13.1	Prioritize and Schedule Capital Improvement Projects		4	0	8	24	44	0	0	80
13.2	Conduct Workshops on Proposed Project Phasing		6	0	6	6	12	0	0	30
13.3	Develop CIP		4	0	4	20	40	0	0	74
13.4	Prepare Technical Memorandum on Recommended CIP		8	0	4	16	30	0	0	58
		Subtotal Task 13.0	22	0	22	66	132	0	0	242
14.0	Prepare Draft Master Plan Update Report and Executive Summary									
14.1	Prepare Draft Master Plan Update Report and Executive Summary		12	0	12	80	80	30	48	290
14.2	Prepare Final Master Plan Update Report and Executive Summary		8	0	8	40	40	16	28	156
		Subtotal Task 14.0	20	0	20	120	120	46	76	446
15.0	Model Installation and Training									
15.1	Develop Model Documentation		0	0	0	24	40	12	0	88
15.2	Assist in Model Installation		0	0	0	4	8	0	0	12
15.3	Provide Model Training		0	0	2	40	60	32	0	162
		Subtotal Task 15.0	0	0	2	68	108	44	0	262
16.0	Project Management and Coordination									
16.1	Prepare Project Work Plan and Conduct Kickoff Meeting		8	0	14	0	0	0	6	52
16.2	Project Monitoring, Administration, and Status Reporting		20	0	792	0	0	0	616	1428
16.3	Project Status Meetings		44	0	68	88	0	88	88	368
16.4	Project O&M Activities		24	186	32	40	0	70	8	360
16.5	Assist in City Council Presentation		8	0	16	8	0	12	16	60
		Subtotal Task 16.0	104	186	842	136	0	194	734	2286
	Totals for Basic Services		328	186	1125	1172	1346	966	818	7217
17.0	ADDITIONAL SERVICES									
17.1	Record Drawing Research		0	0	0	0	0	0	0	100
17.2	Elevation Surveying		0	0	2	0	0	0	0	4
17.3	Flow Monitors		0	0	2	0	0	2	0	4
17.4	Conduct Supplemental Surveying or Topographic Research		0	0	2	0	0	0	0	4
17.5	Meetings		80	0	60	32	0	40	30	262
17.6	Model Support During Training Period		0	0	0	8	16	8	0	40
		Subtotal Task 17.0	80	0	85	32	16	48	30	374
	Column Totals all tasks		468	186	1211	1204	1348	1332	148	7591
	Check =									7591

EXHIBIT D. COST DERIVATIVE and HOURLY FEE SCHEDULE Wastewater Collection System Master Plan Update

T A S K	TASK DESCRIPTION	HOURLY RATE	Technical Director	TRC Principal Engineer	Project Manager	Principal Engineer	Senior Engineer	Engineer	Associate Engineer	Clerical / Admin. Assistant	TOTAL LABOR COSTS	SUB CONSULTANT	Other Direct Charges (ODG's)	TOTAL COSTS
1.0	Compile and Review Existing Information		\$310	\$244	\$182	\$212	\$158	\$115	\$121	\$78				
1.1	Complete, Organize, and Summarize Existing Documents and Data		\$1,240	\$0	\$384	\$3,392	\$1,264	\$1,380	\$4,598	\$524	\$12,462	\$0	\$560	\$13,412
1.2	Assessment of Sower GIS Database		\$0	\$0	\$182	\$1,098	\$6,320	\$460	\$494	\$0	\$8,452	\$0	\$0	\$9,142
1.3	Prepare Technical Memorandum on Existing Information		\$1,240	\$0	\$2,528	\$728	\$2,528	\$460	\$494	\$0	\$8,452	\$0	\$0	\$9,142
	Subtotal Task 1.0		\$2,480	\$0	\$1,274	\$8,480	\$10,112	\$2,300	\$5,586	\$524	\$30,936	\$0	\$788	\$31,624
2.0	Additional Data Collection													
2.1	Record Drawing Research		\$0	\$0	\$0	\$0	\$0	\$4,600	\$0	\$0	\$4,600	\$0	\$558	\$5,158
2.2	Elevation Surveying		\$0	\$0	\$182	\$1,898	\$0	\$0	\$1,898	\$0	\$3,914	\$15,600	\$0	\$19,212
	Subtotal Task 2.0		\$0	\$0	\$182	\$1,898	\$0	\$4,600	\$1,898	\$0	\$9,214	\$15,600	\$55	\$23,869
3.0	Review and Update Land Use Planning Criteria													
3.1	Define Existing and Future City Service Area		\$2,480	\$0	\$384	\$948	\$0	\$460	\$484	\$0	\$4,656	\$0	\$0	\$4,656
3.2	Compile Information from Applicable Land Use Plans		\$0	\$0	\$0	\$1,898	\$2,528	\$1,380	\$1,452	\$0	\$7,058	\$0	\$0	\$7,058
3.3	Meet with City Planning Staff		\$2,480	\$0	\$1,458	\$1,898	\$0	\$0	\$0	\$0	\$5,832	\$0	\$0	\$7,058
3.4	Refine Land Use Categories and Densities		\$0	\$0	\$0	\$1,898	\$1,264	\$1,380	\$1,452	\$0	\$5,792	\$0	\$0	\$5,792
3.5	Develop Digital Mapping of Future Land Uses		\$0	\$0	\$0	\$1,898	\$1,264	\$2,300	\$2,420	\$0	\$7,880	\$258,800	\$0	\$266,680
3.6	Determine Development Timing		\$0	\$0	\$0	\$3,392	\$2,528	\$2,300	\$2,420	\$0	\$10,840	\$0	\$0	\$10,840
3.7	Prepare Technical Memorandum on Land Use Planning Criteria		\$3,728	\$0	\$728	\$5,088	\$2,528	\$1,380	\$1,452	\$0	\$14,868	\$0	\$248	\$15,116
3.8	Conduct Workshops on Land Use Planning Criteria		\$4,960	\$0	\$2,812	\$3,392	\$0	\$0	\$1,264	\$0	\$11,264	\$0	\$2,850	\$13,914
	Subtotal Task 3.0		\$13,640	\$0	\$5,480	\$19,504	\$10,112	\$8,200	\$9,680	\$0	\$67,596	\$258,800	\$2,897	\$354,953
4.0	Review and Update Flow Criteria													
4.1	Review Existing Flow Monitoring Data		\$0	\$0	\$0	\$948	\$1,264	\$1,840	\$1,898	\$0	\$5,888	\$0	\$0	\$5,888
4.2	Develop Plan for Supplemental Calibration and Flow Monitoring		\$1,240	\$0	\$182	\$3,392	\$0,320	\$0	\$0	\$0	\$11,134	\$0	\$0	\$11,134
4.3	Conduct Flow Monitoring and Meter Calibration		\$0	\$0	\$0	\$848	\$832	\$0	\$0	\$0	\$1,680	\$67,320	\$0	\$68,000
4.4	Analyze Flow Data and Develop Flow Parameters		\$0	\$0	\$0	\$3,392	\$6,320	\$6,900	\$7,280	\$0	\$23,872	\$0	\$0	\$23,872
4.5	Prepare Technical Memorandum on Design Flow Criteria		\$620	\$0	\$728	\$3,392	\$1,264	\$480	\$484	\$0	\$6,948	\$0	\$248	\$7,196
4.6	Conduct Workshop and Finalize Design Flow Criteria		\$1,240	\$0	\$1,458	\$3,392	\$0	\$0	\$0	\$0	\$6,088	\$0	\$1,328	\$7,416
	Subtotal Task 4.0		\$3,100	\$0	\$2,368	\$15,264	\$15,800	\$9,200	\$9,680	\$0	\$55,410	\$67,320	\$1,572	\$124,302
5.0	Evaluate Hydraulic Modeling Software													
5.1	Identify Modeling Needs and Establish Model Evaluation Criteria		\$0	\$0	\$0	\$3,392	\$0	\$0	\$0	\$0	\$3,392	\$0	\$0	\$3,392
5.2	Define Flow Computation Requirements		\$0	\$0	\$0	\$1,898	\$2,528	\$0	\$0	\$0	\$4,224	\$0	\$0	\$4,224
5.3	Prepare Technical Memorandum		\$1,240	\$0	\$728	\$3,392	\$0	\$2,300	\$2,420	\$0	\$10,080	\$0	\$225	\$10,305
5.4	Conduct Model Workshop; Select and Purchase Software		\$1,240	\$0	\$1,458	\$3,392	\$0	\$820	\$0	\$0	\$4,580	\$0	\$1,204	\$5,784
	Subtotal Task 5.0		\$2,480	\$0	\$1,458	\$10,178	\$2,528	\$3,220	\$2,420	\$0	\$22,288	\$0	\$1,428	\$23,716
6.0	Construct and Verify Model of Existing System													
6.1	Build Model Network and Database		\$0	\$0	\$0	\$3,392	\$1,264	\$4,600	\$4,840	\$0	\$14,096	\$0	\$0	\$14,096
6.2	Validate Network Data; Identify Survey Needs		\$0	\$0	\$0	\$1,898	\$1,264	\$4,600	\$4,840	\$0	\$12,400	\$0	\$0	\$12,400
6.3	Complete Pump Station Data		\$0	\$0	\$0	\$424	\$0	\$1,150	\$1,210	\$0	\$2,784	\$0	\$0	\$2,784
6.4	Develop Flow Generation Program		\$0	\$0	\$0	\$1,898	\$6,320	\$0	\$0	\$0	\$8,016	\$0	\$0	\$8,016
6.5	Define Existing Sewersheds and Flows		\$0	\$0	\$0	\$3,392	\$1,264	\$4,600	\$5,324	\$0	\$14,810	\$0	\$0	\$14,810
6.6	Calibrate and Verify Model for Existing Conditions		\$2,480	\$0	\$728	\$3,392	\$6,320	\$9,200	\$9,680	\$0	\$28,520	\$0	\$0	\$28,520
6.7	Prepare Technical Memorandum on Model Development		\$0	\$0	\$728	\$3,392	\$6,320	\$460	\$484	\$0	\$13,884	\$0	\$225	\$14,089
	Subtotal Task 6.0		\$2,480	\$0	\$728	\$17,384	\$22,752	\$24,840	\$28,378	\$0	\$94,562	\$0	\$225	\$94,787
7.0	Develop Future Flows and Sewersheds													
7.1	Develop Mapping for Undeveloped Areas and Define Future Sewersheds		\$0	\$0	\$0	\$1,898	\$0	\$4,600	\$4,840	\$0	\$11,136	\$0	\$0	\$11,136
7.2	Define Trunk System Configuration for Undeveloped Areas		\$2,480	\$0	\$0	\$1,898	\$5,900	\$5,900	\$6,534	\$0	\$16,690	\$0	\$0	\$16,690
7.3	Develop Input Flows for Future Growth Scenarios		\$2,480	\$0	\$728	\$1,898	\$2,528	\$2,300	\$2,420	\$0	\$11,424	\$0	\$0	\$11,424
7.4	Prepare Technical Memorandum on Proposed Wastewater Flows		\$0	\$0	\$728	\$3,392	\$1,264	\$460	\$484	\$0	\$8,808	\$0	\$248	\$9,056
	Subtotal Task 7.0		\$7,440	\$0	\$728	\$8,480	\$13,752	\$13,340	\$14,278	\$0	\$48,058	\$0	\$248	\$48,306
8.0	Perform Hydraulic Analysis and Identify Deficiencies													
8.1	Conduct Model Simulations		\$0	\$0	\$0	\$0	\$0	\$2,300	\$1,210	\$0	\$8,670	\$0	\$0	\$8,670
8.2	Identify System Deficiencies for Existing and Future Conditions		\$0	\$0	\$0	\$3,392	\$3,792	\$2,300	\$2,420	\$0	\$11,904	\$0	\$0	\$11,904
8.3	Prepare Technical Memorandum on Model Results		\$0	\$0	\$728	\$3,392	\$1,264	\$820	\$1,452	\$0	\$7,756	\$0	\$248	\$8,004
	Subtotal Task 8.0		\$0	\$0	\$728	\$6,784	\$8,216	\$5,320	\$5,082	\$0	\$28,330	\$0	\$248	\$28,578
9.0	Review and Refine Facility Design and Cost Criteria													
9.1	Develop Master Plan Update Design Criteria		\$1,240	\$0	\$0	\$3,392	\$6,552	\$0	\$0	\$0	\$11,584	\$0	\$0	\$11,584
9.2	Develop Master Plan Update Cost Criteria		\$1,240	\$0	\$0	\$1,898	\$4,108	\$1,380	\$0	\$0	\$8,424	\$0	\$0	\$9,424
9.3	Prepare Technical Memorandum on Design and Cost Criteria		\$2,480	\$0	\$728	\$3,816	\$3,160	\$0	\$0	\$0	\$10,184	\$0	\$0	\$10,184
	Subtotal Task 9.0		\$4,960	\$0	\$728	\$8,904	\$14,220	\$1,380	\$0	\$0	\$30,192	\$0	\$248	\$30,440
10.0	Review and Evaluate WRF Sites													

MWH

EXHIBIT D. COST DERIVATIVE and HOURLY FEE SCHEDULE Wastewater Collection System Master Plan Update

10.1	Evaluate Existing/Future Water Reclamation Facilities	\$0	\$1,820	\$5,088	\$1,898	\$2,300	\$388	\$0	\$12,072	\$0	\$12,072
10.2	Develop Cost Estimates	\$0	\$728	\$3,302	\$1,898	\$1,150	\$1,210	\$0	\$8,376	\$0	\$8,376
10.3	Prepare Technical Memorandum on Evaluation of WRF Sites	\$2,480	\$1,820	\$3,302	\$1,898	\$680	\$0	\$0	\$10,278	\$0	\$10,278
	Subtotal Task 10.0	\$2,480	\$4,368	\$11,872	\$5,696	\$4,140	\$2,178	\$0	\$30,228	\$0	\$30,228
11.0	Develop Sewer Facilities Expansion Projects										
11.1	Develop Methodology and Procedures for Expansion Project Development	\$2,480	\$0	\$3,302	\$3,782	\$2,300	\$2,420	\$0	\$14,384	\$0	\$14,384
11.2	Review and Develop Project Alternatives	\$2,480	\$728	\$8,430	\$7,584	\$5,290	\$0,808	\$0	\$30,370	\$0	\$30,370
11.3	Conduct Supplemental Surveying or Topographic Research	\$0	\$0	\$0	\$0	\$920	\$0	\$0	\$920	\$15,400	\$16,320
11.4	Conduct Workshops on Proposed Projects	\$1,240	\$0	\$2,544	\$1,898	\$0	\$0	\$0	\$7,138	\$0	\$7,138
11.5	Refine Projects and Recommended Alignments	\$0	\$0	\$5,088	\$3,782	\$3,880	\$3,388	\$0	\$15,948	\$0	\$15,948
11.6	Run Model to Confirm Projects	\$0	\$0	\$1,696	\$2,728	\$2,300	\$2,420	\$0	\$8,944	\$0	\$8,944
11.7	Develop Cost Estimates	\$0	\$728	\$1,696	\$2,228	\$460	\$0	\$0	\$5,896	\$0	\$5,896
11.8	Prepare Technical Memorandum on Recommended Projects	\$3,720	\$728	\$5,088	\$2,228	\$2,760	\$3,388	\$0	\$22,004	\$22,252	\$44,256
	Subtotal Task 11.0	\$8,920	\$3,640	\$27,984	\$28,440	\$17,710	\$17,908	\$0	\$105,802	\$15,400	\$123,682
12.0	Develop Improvement Projects for the Existing Trunk Sewer System										
12.1	Review and Develop Alternatives for Trunk Sewer Relief Projects	\$2,480	\$728	\$9,328	\$7,584	\$5,920	\$4,840	\$0	\$30,480	\$0	\$30,480
12.2	Develop Pump Station Improvement Alternatives	\$0	\$0	\$2,120	\$3,160	\$0	\$0	\$0	\$5,280	\$0	\$5,280
12.3	Research Traffic Conditions and Potential Utility Conflicts	\$0	\$0	\$1,696	\$8,320	\$920	\$988	\$0	\$9,904	\$0	\$9,904
12.4	Conduct Supplemental Surveying	\$0	\$0	\$0	\$0	\$920	\$0	\$0	\$920	\$15,400	\$16,320
12.5	Run Hydraulic Model to Analyze Alternatives	\$0	\$0	\$3,302	\$2,528	\$2,300	\$2,420	\$0	\$10,840	\$0	\$10,840
12.6	Conduct Workshops on Proposed Relief Projects	\$1,240	\$0	\$2,544	\$1,898	\$0	\$0	\$0	\$7,138	\$0	\$7,138
12.7	Refine Projects and Recommended Alignments	\$0	\$0	\$3,302	\$2,528	\$2,980	\$0	\$0	\$11,572	\$0	\$11,572
12.8	Develop Cost Estimates	\$0	\$728	\$1,696	\$2,228	\$460	\$0	\$0	\$5,896	\$0	\$5,896
12.9	Prepare Technical Memorandum on Recommended Projects	\$3,720	\$728	\$5,088	\$2,228	\$2,760	\$3,146	\$0	\$23,028	\$0	\$23,028
	Subtotal Task 12.0	\$7,440	\$3,640	\$29,256	\$34,128	\$15,870	\$14,520	\$0	\$104,854	\$15,400	\$122,554
13.0	Develop Capital Improvement Program										
13.1	Prioritize and Schedule Capital Improvement Projects	\$1,240	\$1,456	\$5,088	\$8,560	\$0	\$0	\$0	\$14,736	\$0	\$14,736
13.2	Conduct Workshops on Proposed Project Phasing	\$1,860	\$1,092	\$1,272	\$1,898	\$0	\$0	\$0	\$6,120	\$0	\$6,120
13.3	Develop CIP	\$1,240	\$728	\$2,480	\$7,268	\$0	\$0	\$0	\$13,476	\$0	\$13,476
13.4	Prepare Technical Memorandum on Recommended CIP	\$2,480	\$728	\$3,382	\$4,740	\$0	\$0	\$0	\$11,588	\$0	\$11,588
	Subtotal Task 13.0	\$6,800	\$4,004	\$13,992	\$20,658	\$0	\$0	\$0	\$43,672	\$0	\$43,672
14.0	Prepare Draft Master Plan Update Report and Executive Summary										
14.1	Prepare Draft Master Plan Update Report and Executive Summary	\$3,720	\$2,184	\$16,960	\$12,840	\$3,220	\$3,630	\$3,744	\$40,898	\$0	\$47,752
14.2	Prepare Final Master Plan Update Report and Executive Summary	\$2,480	\$1,456	\$8,430	\$6,200	\$1,840	\$1,908	\$2,184	\$24,898	\$28,001	\$52,901
	Subtotal Task 14.0	\$6,200	\$3,640	\$25,440	\$19,040	\$5,060	\$5,538	\$5,928	\$65,794	\$28,001	\$93,795
15.0	Model Installation and Training										
15.1	Develop Model Documentation	\$0	\$0	\$5,088	\$6,320	\$1,380	\$1,452	\$0	\$14,240	\$0	\$14,240
15.2	Assist in Model Installation	\$0	\$0	\$848	\$1,284	\$0	\$0	\$0	\$2,112	\$0	\$2,112
15.3	Provide Model Training	\$0	\$364	\$3,640	\$9,480	\$3,220	\$3,872	\$0	\$25,418	\$0	\$25,418
	Subtotal Task 15.0	\$0	\$364	\$14,416	\$17,084	\$4,600	\$5,324	\$0	\$41,768	\$0	\$41,768
16.0	Project Management and Coordination										
16.1	Prepare Project Work Plan and Conduct Kickoff Meeting	\$2,480	\$2,548	\$0	\$0	\$2,760	\$0	\$488	\$9,256	\$0	\$10,253
16.2	Project Monitoring, Administration, and Status Reporting	\$6,200	\$144,144	\$0	\$0	\$0	\$0	\$48,048	\$188,392	\$0	\$198,392
16.3	Project Status Meetings	\$13,640	\$0	\$18,656	\$0	\$10,120	\$0	\$0,864	\$65,296	\$0	\$76,272
16.4	Project O&M/C Activities	\$7,440	\$45,394	\$5,824	\$4,480	\$3,050	\$0	\$624	\$75,802	\$0	\$83,906
16.5	Assist in City Council Presentation	\$2,480	\$2,912	\$1,898	\$0	\$1,380	\$0	\$1,248	\$3,116	\$0	\$4,364
	Subtotal Task 16.0	\$29,200	\$171,444	\$28,382	\$5,364	\$22,310	\$0	\$57,292	\$357,462	\$0	\$414,754
	Totals for Basic Services	\$101,600	\$294,760	\$248,464	\$212,688	\$143,290	\$120,516	\$63,404	\$1,140,556	\$572,121	\$1,962,781
17.0	ADDITIONAL SERVICES										
17.1	Record Drawing Research	\$2	\$0	\$0	\$0	\$11,500	\$0	\$0	\$11,500	\$0	\$11,500
17.2	Elevation Surveying	\$0	\$384	\$0	\$0	\$230	\$0	\$0	\$594	\$15,400	\$16,994
17.3	Flow Measurements	\$0	\$384	\$0	\$0	\$230	\$0	\$0	\$594	\$33,880	\$35,854
17.4	Conduct Supplemental Surveying or Topographic Research	\$24,800	\$0	\$0	\$0	\$230	\$0	\$0	\$594	\$15,400	\$20,724
17.5	Meetings	\$0	\$14,560	\$0	\$0	\$4,600	\$0	\$2,340	\$53,084	\$0	\$59,924
17.6	Model Support During Training Period	\$24,800	\$1,696	\$2,528	\$2,528	\$820	\$988	\$0	\$6,112	\$13,416	\$19,528
	Subtotal Task 17.0	\$54,400	\$15,656	\$9,400	\$2,528	\$18,790	\$3,000	\$2,300	\$72,778	\$24,280	\$97,058
	Column Totals All Tasks	\$158,440	\$445,364	\$356,944	\$275,186	\$160,080	\$123,516	\$69,814	\$1,213,334	\$646,401	\$1,959,735
	Total For Basic Services	\$158,440	\$445,364	\$356,944	\$275,186	\$160,080	\$123,516	\$69,814	\$1,213,334	\$646,401	\$1,959,735
	Total for Additional Services	\$1,592,788	\$154,613	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,747,401
	TOTAL PROJECT COST	\$1,747,401	\$154,613	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,904,014

**EXHIBIT E – PRELIMINARY SCHEDULE
WASTEWATER COLLECTION SYSTEM MASTER PLAN UPDATE**

Primary Tasks

Days after NTP*

1.0	Compile and Review Existing Information	44
2.0	Additional Data Collection	41
3.0	Review and Update Land Use Planning Criteria	150
4.0	Review and Update Flow Criteria	80
5.0	Evaluate Hydraulic Modeling Software	36
6.0	Construct and Verify Model of Existing System	148
7.0	Develop Future Flows and Sewersheds	71
8.0	Perform Hydraulic Analysis and Identify Deficiencies	46
9.0	Review and Refine Facility Design and Cost Criteria	40
10.0	Review and Evaluate WRF Sites	52
11.0	Develop Sewer Facilities Expansion Projects	113
12.0	Develop Improvement Projects for the Existing Trunk Sewer System	105
13.0	Develop Capital Improvement Program	45
14.0	Prepare Draft Master Plan Update Report and Executive Summary	30
15.0	Model Installation and Training	404
16.0	Project Management and Coordination	457

* Working Days

EXHIBIT F. Invoice for Wastewater Collection System Master Plan Update

Contract SubTask #	TASK DESCRIPTION	Original Value of Task	% of Task Completed this Period	Value of Work Completed this Period	% Task Completed to Date	Value of Work Completed to Date	% of Work Left in Budget	Value of Work Left in Budget
1.0	Compile and Review Existing Information							
1.1	Compile, Organize, and Summarize Existing Documents and Data	\$ 13,412	0%	\$ -	0%	\$ -	100%	\$ 13,412
1.2	Assessment of Sewer GIS Database	\$ 9,142	0%	\$ -	0%	\$ -	100%	\$ 9,142
1.3	Prepare Technical Memorandum on Existing Information	\$ 9,080	0%	\$ -	0%	\$ -	100%	\$ 9,080
	Subtotal Task 1.0	\$ 31,634		\$ -		\$ -		\$ 31,634
2.0	Additional Data Collection							
2.1	Record Drawing Research	\$ 4,655	0%	\$ -	0%	\$ -	100%	\$ 4,655
2.2	Elevation Surveying	\$ 19,214	0%	\$ -	0%	\$ -	100%	\$ 19,214
	Subtotal Task 2.0	\$ 23,869		\$ -		\$ -		\$ 23,869
3.0	Review and Update City Service Area							
3.1	Define Existing and Future City Service Area	\$ 4,636	0%	\$ -	0%	\$ -	100%	\$ 4,636
3.2	Complete Information from Applicable Land Use Plans	\$ 7,056	0%	\$ -	0%	\$ -	100%	\$ 7,056
3.3	Meet with City Planning Staff	\$ 5,632	0%	\$ -	0%	\$ -	100%	\$ 5,632
3.4	Refine Land Use Categories and Densities	\$ 5,792	0%	\$ -	0%	\$ -	100%	\$ 5,792
3.5	Develop Digital Mapping of Future Land Uses	\$ 292,140	0%	\$ -	0%	\$ -	100%	\$ 292,140
3.6	Determine Development Timing	\$ 10,640	0%	\$ -	0%	\$ -	100%	\$ 10,640
3.7	Prepare Technical Memorandum on Land Use Planning Criteria	\$ 15,144	0%	\$ -	0%	\$ -	100%	\$ 15,144
3.8	Conduct Workshops on Land Use Planning Criteria	\$ 13,914	0%	\$ -	0%	\$ -	100%	\$ 13,914
	Subtotal Task 3.0	\$ 354,953		\$ -		\$ -		\$ 354,953
4.0	Develop and Calibrate Flow Model							
4.1	Review Existing Flow Monitoring Data	\$ 5,888	0%	\$ -	0%	\$ -	100%	\$ 5,888
4.2	Develop Plan for Supplemental Calibration and Flow Monitoring	\$ 11,134	0%	\$ -	0%	\$ -	100%	\$ 11,134
4.3	Conduct Flow Monitoring and Meter Calibration	\$ 68,800	0%	\$ -	0%	\$ -	100%	\$ 68,800
4.4	Analyze Flow Data and Develop Flow Parameters	\$ 23,872	0%	\$ -	0%	\$ -	100%	\$ 23,872
4.5	Prepare Technical Memorandum on Design Flow Criteria	\$ 7,196	0%	\$ -	0%	\$ -	100%	\$ 7,196
4.6	Conduct Workshop and Finalize Design Flow Criteria	\$ 7,413	0%	\$ -	0%	\$ -	100%	\$ 7,413
	Subtotal Task 4.0	\$ 124,302		\$ -		\$ -		\$ 124,302
5.0	Evaluate Hydraulic Modeling Software							
5.1	Identify Modeling Needs and Establish Model Evaluation Criteria	\$ 3,392	0%	\$ -	0%	\$ -	100%	\$ 3,392
5.2	Define Flow Computation Requirements	\$ 4,224	0%	\$ -	0%	\$ -	100%	\$ 4,224
5.3	Prepare Technical Memorandum	\$ 10,305	0%	\$ -	0%	\$ -	100%	\$ 10,305
5.4	Conduct Model Workshop, Select and Purchase Software	\$ 5,788	0%	\$ -	0%	\$ -	100%	\$ 5,788
	Subtotal Task 5.0	\$ 23,709		\$ -		\$ -		\$ 23,709
6.0	Construct and Validate Hydraulic Modeling Software							
6.1	Build Model Network and Database	\$ 14,096	0%	\$ -	0%	\$ -	100%	\$ 14,096
6.2	Validate Network Data; Identify Survey Needs	\$ 12,400	0%	\$ -	0%	\$ -	100%	\$ 12,400
6.3	Compile Pump Station Data	\$ 2,784	0%	\$ -	0%	\$ -	100%	\$ 2,784
6.4	Develop Flow Generation Program	\$ 8,016	0%	\$ -	0%	\$ -	100%	\$ 8,016
6.5	Define Existing Sewersheds and Flows	\$ 14,810	0%	\$ -	0%	\$ -	100%	\$ 14,810
6.6	Calibrate and Verify Model for Existing Conditions	\$ 28,592	0%	\$ -	0%	\$ -	100%	\$ 28,592
6.7	Prepare Technical Memorandum on Model Development	\$ 14,089	0%	\$ -	0%	\$ -	100%	\$ 14,089
	Subtotal Task 6.0	\$ 94,787		\$ -		\$ -		\$ 94,787
7.0	Develop Future Flows and Sewersheds							
7.1	Develop Mapping for Undeveloped Areas and Define Future Sewersheds	\$ 11,136	0%	\$ -	0%	\$ -	100%	\$ 11,136

EXHIBIT F. Invoice for Wastewater Collection System Master Plan Update

7.2	Define Trunk System Configuration for Undeveloped Areas	\$	16,690	0%	\$	-	0%	\$	-	100%	\$	16,690
7.3	Develop Input Flows for Future Growth Scenarios	\$	11,424	0%	\$	-	0%	\$	-	100%	\$	11,424
7.4	Prepare Technical Memorandum on Projected Wastewater Flows	\$	9,056	0%	\$	-	0%	\$	-	100%	\$	9,056
	Subtotal Task 7.0	\$	48,306		\$	-		\$	-		\$	48,306
8.0	Perform Hydraulic Analysis and Identify Deficiencies											
8.1	Conduct Model Simulations	\$	6,670	0%	\$	-	0%	\$	-	100%	\$	6,670
8.2	Identify System Deficiencies for Existing and Future Conditions	\$	11,904	0%	\$	-	0%	\$	-	100%	\$	11,904
8.3	Prepare Technical Memorandum on Model Results	\$	8,004	0%	\$	-	0%	\$	-	100%	\$	8,004
	Subtotal Task 8.0	\$	26,578		\$	-		\$	-		\$	26,578
9.0	Review and Update Facility Design Criteria											
9.1	Develop Master Plan Update Design Criteria	\$	11,584	0%	\$	-	0%	\$	-	100%	\$	11,584
9.2	Develop Master Plan Update Cost Criteria	\$	8,424	0%	\$	-	0%	\$	-	100%	\$	8,424
9.3	Prepare Technical Memorandum on Design and Cost Criteria	\$	10,432	0%	\$	-	0%	\$	-	100%	\$	10,432
	Subtotal Task 9.0	\$	30,440		\$	-		\$	-		\$	30,440
10.0	Review and Evaluate WRF Sites											
10.1	Evaluate Existing/Future Water Reclamation Facilities	\$	12,072	0%	\$	-	0%	\$	-	100%	\$	12,072
10.2	Develop Cost Estimates	\$	8,376	0%	\$	-	0%	\$	-	100%	\$	8,376
10.3	Prepare Technical Memorandum on Evaluation of WRF Sites	\$	10,526	0%	\$	-	0%	\$	-	100%	\$	10,526
	Subtotal Task 10.0	\$	30,974		\$	-		\$	-		\$	30,974
11.0	Develop Sewer Facilities Expansion Projects											
11.1	Develop Methodology and Procedures for Expansion Project Development	\$	14,384	0%	\$	-	0%	\$	-	100%	\$	14,384
11.2	Review and Develop Project Alternatives	\$	30,370	0%	\$	-	0%	\$	-	100%	\$	30,370
11.3	Conduct Supplemental Surveying or Topographic Research	\$	16,320	0%	\$	-	0%	\$	-	100%	\$	16,320
11.4	Conduct Workshops on Proposed Projects	\$	9,786	0%	\$	-	0%	\$	-	100%	\$	9,786
11.5	Refine Projects and Recommended Alignments	\$	15,948	0%	\$	-	0%	\$	-	100%	\$	15,948
11.6	Run Model to Confirm Projects	\$	8,944	0%	\$	-	0%	\$	-	100%	\$	8,944
11.7	Develop Cost Estimates	\$	5,896	0%	\$	-	0%	\$	-	100%	\$	5,896
11.8	Prepare Technical Memorandum on Recommended Projects	\$	22,252	0%	\$	-	0%	\$	-	100%	\$	22,252
	Subtotal Task 11.0	\$	123,899		\$	-		\$	-		\$	123,899
12.0	Develop Improvement Projects for the Existing Trunk Sewer System											
12.1	Review and Develop Alternatives for Trunk Sewer Relief Projects	\$	30,480	0%	\$	-	0%	\$	-	100%	\$	30,480
12.2	Develop Pump Station Improvement Alternatives	\$	5,280	0%	\$	-	0%	\$	-	100%	\$	5,280
12.3	Research Traffic Corridors and Potential Utility Conflicts	\$	9,904	0%	\$	-	0%	\$	-	100%	\$	9,904
12.4	Conduct Supplemental Surveying	\$	16,320	0%	\$	-	0%	\$	-	100%	\$	16,320
12.5	Run Hydraulic Model to Analyze Alternatives	\$	10,640	0%	\$	-	0%	\$	-	100%	\$	10,640
12.6	Conduct Workshops on Proposed Relief Projects	\$	9,786	0%	\$	-	0%	\$	-	100%	\$	9,786
12.7	Refine Projects and Recommended Alignments	\$	11,572	0%	\$	-	0%	\$	-	100%	\$	11,572
12.8	Develop Cost Estimates	\$	10,296	0%	\$	-	0%	\$	-	100%	\$	10,296
12.9	Prepare Technical Memorandum on Recommended Projects	\$	23,274	0%	\$	-	0%	\$	-	100%	\$	23,274
	Subtotal Task 12.0	\$	127,551		\$	-		\$	-		\$	127,551
13.0	Develop Capital Improvement Program											
13.1	Prioritize and Schedule Capital Improvement Projects	\$	14,736	0%	\$	-	0%	\$	-	100%	\$	14,736
13.2	Conduct Workshops on Proposed Project Phasing	\$	8,770	0%	\$	-	0%	\$	-	100%	\$	8,770
13.3	Develop CIP	\$	13,476	0%	\$	-	0%	\$	-	100%	\$	13,476
13.4	Prepare Technical Memorandum on Recommended CIP	\$	11,588	0%	\$	-	0%	\$	-	100%	\$	11,588
	Subtotal Task 13.0	\$	48,569		\$	-		\$	-		\$	48,569

EXHIBIT F. Invoice for Wastewater Collection System Master Plan Update

[illegible]

Exhibit G
CERTIFICATE
DISCLOSURE OF OWNERSHIP/PRINCIPALS

1. Definitions

"City" means the City of Las Vegas.

"City Council" means the governing body of the City of Las Vegas.

"Contracting Entity" means the individual, partnership, or corporation seeking to enter into a contract or agreement with the City of Las Vegas.

"Principal" means, for each type of business organization, the following: (a) sole proprietorship – the owner of the business; (b) corporation – the directors and officers of the corporation; but not any branch managers of offices which are a part of the corporation; (c) partnership – the general partner and limited partners; (d) limited liability company – the managing member as well as all the other members.

2. Policy

In accordance with Resolution 79-99 and 105-99 adopted by the City Council, Contracting Entities seeking to enter into certain contracts or agreements with the City of Las Vegas must disclose information regarding ownership interests and principals. Such disclosure generally is required in conjunction with a Request for Proposals (RFP). In other cases, such disclosure must be made prior to the execution of a contract or agreement.

3. Instructions

The disclosure required by the Resolutions referenced above shall be made through the completion and execution of this Certificate. The Contracting Entity shall complete Block 1, Block 2, and Block 3. The Contracting Entity shall complete either Block 4 or its alternate in Block 5. Specific information, which must be provided, is highlighted. An Officer or other official authorized to contractually bind the Contracting Entity shall sign and date the Certificate, and such signing shall be notarized.

4. Incorporation

This Certificate shall be incorporated into the resulting contract or agreement, if any, between the City and the Contracting Entity. Upon execution of such contract or agreement, the Contracting Entity is under a continuing obligation to notify the City in writing of any material changes to the information in this Certificate. This notification shall be made within fifteen (15) days of the change. Failure to notify the City of any material change may result, at the option of the City, in a default termination (in whole or in part) of the contract or agreement, and/or a withholding of payments due the Contracting Entity.

Block 1	Contracting Entity
Name	MWH Americas, Inc.
Address	3014 West Charleston Blvd. Las Vegas, NV 89102
Telephone	702-878-8010
EIN or DUNS	869237024

Block 2	Description
Subject Matter of Contract/Agreement	Engineering Services for Wastewater Collection System Master Plan Update
RFP #	

Block 3	Type of Business
<input type="checkbox"/> Individual	<input type="checkbox"/> Partnership
<input type="checkbox"/> Limited Liability Company	<input checked="" type="checkbox"/> Corporation

**CERTIFICATE – DISCLOSURE OF OWNERSHIP/PRINCIPALS
(CONTINUED)**

Block 4: Disclosure of Ownership and Principals

In the space below, the Contracting Entity must disclose all principals (including partners) of the Contracting Entity, as well as persons or entities holding more than one-percent (1%) ownership interest in the Contracting Entity.

FULL NAME/TITLE

BUSINESS ADDRESS**BUSINESS PHONE**[illegible]

The Contracting Entity shall continue the above list on a sheet of paper entitled "Disclosure of Principals – Continuation" until full and complete disclosure is made. If continuation sheets are attached, please indicate the number of sheets: 14

Block 5: Disclosure of Ownership and Principals - Alternate

If the Contracting Entity, or its principals or partners, are required to provide disclosure (of persons or entities holding an ownership interest) under federal law (such as disclosure required by the Securities and Exchange Commission or the Employee Retirement Income Act), a copy of such disclosure may be attached to this Certificate in lieu of providing the information set forth in Block 4 above. A description of such disclosure documents must be included below.

Name of Attached Document

Date of Attached Document

Number of Pages

I certify, under penalty of perjury, that all the information provided in this Certificate is current, complete, and accurate. I further certify that I am an individual authorized to contractually bind the above named Contracting Entity.


J. Thomas Rowell, P.E., Vice President

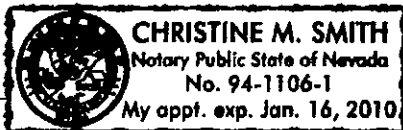
April 28, 2006

Discussion

Subscribed and sworn to before me this 28th day of

2006.

Notary Public



MWH Americas, Inc.

Summary as of

03/07/2006

Status: Active Phone #: (303) 410-4000
Entity Type: Corporation Fax #: (303) 410-4100
Federal ID #: 95-1878805 Internal #:
Corporate Comment: D&B # 86-923-7024 Nancy Durovka 5/12/2003 9:49:52 AM
MWA is a "C Corp" per Mike Pick/PAS-3 Accounting Nancy
Durovka 7/1/2003 2:53:12 PM Montgomery Watson Americas
Inc. Bolivia is a branch of MWA not an entity. (Bolivia
Taxpayer Register Number - 9501932) Lynette Ikenouye 9/8/2003
3:32:40 PM

Tax Year End: 8711 Employees: Yes

Fiscal Year End: 12/31

Annual Meeting:

Policy #:

Effective Date:

Expiration Date:

REGION: MWH Americas

Insurance Carrier:

Term:

Comments:

Type of Business:

Primary Address

370 Interlocken Blvd., Ste. 300

Broomfield Colorado 80021 United States

Bylaws Information:

Purpose of Business: Environmental Consulting Engineering Chris Martel 3/20/2002
8:44:32 AM

Location of Minute
Books: DEN-2 Library

Location of Seal: DEN-2 (Mike Donnelly's office) & DEN-7 File Room

Former Name(s)

	Start Date	End Date
James M. Montgomery, Consulting Engineers, Inc.	Oct 8, 1954	Feb 28, 1993

Montgomery Watson Americas, Inc.	Feb 28, 1993	Jun 20, 2001
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Directors

Currently
Authorized:

Min: 7

Max: 9

Quorum: 4

Classes:

	Title	Effective	First Elected	Last Elected
Adams, Jr., Joseph D.	Director	Jan 3, 2006	Feb 1, 2006	Jan 3, 2006
Fellows, Michael H.	Director	Jan 3, 2006	Feb 1, 2006	Jan 3, 2006
Krause, Alan J.	Director	Jan 1, 2003	Jan 1, 2003	Jan 3, 2006
Scharnhorst, Vicki J.	Director	Jan 3, 2006	Feb 1, 2006	Jan 3, 2006
Smith, Donald L.	Director	Jan 1, 2002	Jan 1, 2002	Jan 3, 2006
Swatek, Mark A.	Director	Jan 3, 2005	Jan 3, 2005	Jan 3, 2006
Uhler, Robert B.	Director	Jan 1, 2002	Jan 1, 2002	Jan 3, 2006

Officers

	Title	Effective	First Elected	Last Elected
Aaserude, Robert G.	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Adham, Samer	Vice President	Mar 16, 2002	Mar 16, 2002	Mar 8, 2005
Aiken, Harold V.	Vice President	Aug 14, 2002	Aug 14, 2002	Mar 8, 2005
Aldridge, Lee	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Altieri, Mona E.	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Alvoeiro, Jose	Vice President	Dec 30, 2002	Dec 30, 2002	Mar 8, 2005
Andracheck, Richard G.	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Antal, Daniel J.	Assistant Secretary	Mar 11, 2003	Mar 11, 2003	Mar 8, 2005
Atkinson, Janet L.	Vice President	Mar 9, 2004	Mar 9, 2004	Mar 8, 2005
Atoulikian, Richard G.	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Austin, Roger J.	Vice President	Mar 9, 2004	Mar 9, 2004	Mar 8, 2005
Baker, Gary H.	Vice President	Aug 14, 2002	Aug 14, 2002	Mar 8, 2005

Bassett, Donal J.	Senior Vice President	Mar 8, 2005	Mar 8, 2005	Mar 8, 2005
Behring, Allen G	Vice President	Mar 11, 2003	Mar 11, 2003	Mar 8, 2005
Bell, Dean P.	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Bergen, John A.	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Bhamrah, Ajit S.	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Bishop, Jr., Norman A.	Vice President	Dec 30, 2002	Dec 30, 2002	Mar 8, 2005
Black, R. David	Senior Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Blaszczyk, Paul R.	Vice President	Mar 8, 2005	Mar 8, 2005	Mar 8, 2005
Blaylock, William M.	Vice President	Mar 8, 2005	Mar 8, 2005	Mar 8, 2005
Bluestone, Simon	Vice President	Aug 11, 2004	Aug 11, 2004	Mar 8, 2005
Bock, Clayton	Vice President	Mar 8, 2005	Mar 8, 2005	Mar 8, 2005
Borchardt, James H.	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Bouck, David W	Vice President	Aug 11, 2005	Aug 11, 2005	Aug 11, 2005
Bromley, Charles O.	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Broussard, Brian D.	Vice President	Aug 11, 2004	Aug 11, 2004	Mar 8, 2005
Brown, Marc M.	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Bruen, Michael P.	Vice President	Mar 8, 2005	Mar 8, 2005	Mar 8, 2005
Buetikofer, Larry B.	Vice President	Dec 30, 2002	Dec 30, 2002	Mar 8, 2005
Bunsey, James D.	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Butler, William H.	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Buttz, John A.	Vice President	Mar 16, 2002	Mar 16, 2002	Mar 8, 2005

Caldwell, Donald M.	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Carthew, Geoffrey A.	Vice President	Aug 15, 2001	Aug 15, 2001	Mar 8, 2005
Casas Bou, Alberto	Vice President	Mar 11, 2003	Mar 11, 2003	Mar 8, 2005
Casias, Joseph A.	Vice President	Mar 9, 2004	Mar 9, 2004	Mar 8, 2005
Cass, Ronald M.	Vice President	Mar 9, 2004	Mar 9, 2004	Mar 8, 2005
Charlton, Michaela L.	Vice President	Mar 16, 2002	Mar 16, 2002	Mar 8, 2005
Choudry, Tauseef I.	Vice President	Dec 30, 2002	Dec 30, 2002	Mar 8, 2005
Collyard, Cynthia S.	Vice President	Mar 8, 2005	Mar 8, 2005	Mar 8, 2005
Cook, Janell	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Cooley, Robert V.	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Coon, Jeffrey L.	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Corser, Patrick G.	Vice President	Nov 12, 2002	Nov 12, 2002	Mar 8, 2005
Cryer, Edwin T.	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
D'Antoni, John M.	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Darmody, John D.	Vice President	Mar 16, 2002	Mar 16, 2002	Mar 8, 2005
Dass, Asha M.	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Davert, Jr., Marshall W.	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
DeDen, F. Michael	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Dell, Rodney K.	Vice President	Mar 8, 2005	Mar 8, 2005	Mar 8, 2005
Donnelly, Michael	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Donnelly, Michael	Assistant Secretary	Aug 15, 2001	Aug 15, 2001	Mar 8, 2005

Dornbush, Tomas	Vice President	Mar 16, 2002	Mar 16, 2002	Mar 8, 2005
Dorratcague, Dennis E.	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Dorward, Martin T.	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Dunham, Harry E.	Vice President	Mar 8, 2005	Mar 8, 2005	Mar 8, 2005
Dyok, Wayne M.	Vice President	Dec 30, 2002	Dec 30, 2002	Mar 8, 2005
Eaton, Andrew D.	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Ebersold, David B	Vice President	Mar 11, 2003	Mar 11, 2003	Mar 8, 2005
Edmonds, Rodney L.	Vice President	Mar 16, 2002	Mar 16, 2002	Mar 8, 2005
Ellerbroek, David A.	Vice President	Mar 8, 2005	Mar 8, 2005	Mar 8, 2005
Emerson, Benjamin	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Erickson, Gary M.	President of Federal Services	Jan 5, 2005	Jan 5, 2005	Mar 8, 2005
Erickson, Gary M.	Senior Vice President	Aug 11, 2004	Aug 11, 2004	Mar 8, 2005
Erpenbeck, Donald A.	Vice President	Aug 13, 2003	Aug 13, 2003	Mar 8, 2005
Evenson, Donald E.	Executive Vice President	Mar 11, 2003	Mar 11, 2003	Mar 8, 2005
Finis, Mario	Vice President	Mar 9, 2004	Mar 9, 2004	Mar 8, 2005
Fordham, Mark A.	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Frank, Richard A.	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Fraser, Peter A.	Vice President	Mar 8, 2005	Mar 8, 2005	Mar 8, 2005
Fulton, David A.	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Gadzinski, Norman	Vice President	Mar 8, 2005	Mar 8, 2005	Mar 8, 2005
Ghafoori, Nariman	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005

Ghia, Jitendra R.	Vice President	Aug 15, 2001	Aug 15, 2001	Mar 8, 2005
Gillette, Jacques F.	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Glaser, Harold T.	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Gossett, James W.	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Grant, Frank A.	Senior Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Grant, Glen A.	Vice President	Mar 16, 2002	Mar 16, 2002	Mar 8, 2005
Hambrick, Dixie Ann	Vice President	Mar 8, 2005	Mar 8, 2005	Mar 8, 2005
Hamid, Akhtar	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Hansen, John M.	Vice President	Mar 8, 2005	Mar 8, 2005	Mar 8, 2005
Harper, David J. D.	Chief Financial Officer	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Harris, Kate C.	Vice President	Mar 8, 2005	Mar 8, 2005	Mar 8, 2005
Harris, Victor E.	Vice President	Aug 11, 2005	Aug 11, 2005	Aug 11, 2005
Harrison, David S.	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Hartel, Patrick G.	Vice President	Dec 30, 2002	Dec 30, 2002	Mar 8, 2005
Hartley, Raymond G.	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Hayes, Stanley J.	Vice President	Mar 8, 2005	Mar 8, 2005	Mar 8, 2005
Hendrich, Jeffrey E.	Vice President	Aug 15, 2001	Aug 15, 2001	Mar 8, 2005
Hicks, Michael M.	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Higgins, Jr., Robert B.	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Hillebrenner, Gregory A.	Vice President	Dec 30, 2002	Dec 30, 2002	Mar 8, 2005
Hiltman, Julie M.	Vice President	Aug 11, 2005	Aug 11, 2005	Aug 11, 2005

Honeycutt, Sherman S.	Vice President	Mar 11, 2003	Mar 11, 2003	Mar 8, 2005
Hoover, Michael G.	Vice President	Aug 11, 2005	Aug 11, 2005	Aug 11, 2005
Howard, Bruce K.	Vice President	Mar 16, 2002	Mar 16, 2002	Mar 8, 2005
Humphrey, Glenn R.	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Hunt, Wendy Y.	Vice President	Mar 8, 2005	Mar 8, 2005	Mar 8, 2005
Hyland, Steven J.	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Jacangelo, Joseph G.	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Johnson, Daniel L.	Vice President	Mar 11, 2003	Mar 11, 2003	Mar 8, 2005
Johnson, Lawrence P.	Vice President	Mar 11, 2003	Mar 11, 2003	Mar 8, 2005
Johnson, Tommy L.	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Jossis, Robert G.	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Kahr, Christine A.	Senior Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Kane, Donald A.	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Kelly, Kevin E.	Senior Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Kessack, Philip D.	Vice President	Aug 15, 2001	Aug 15, 2001	Mar 8, 2005
Kessack, Philip D.	Assistant Secretary	Mar 11, 2003	Mar 11, 2003	Mar 8, 2005
King, Jerry A.	Vice President	Aug 11, 2005	Aug 11, 2005	Aug 11, 2005
Kishel, Jeffery	Senior Vice President	Mar 16, 2002	Mar 16, 2002	Mar 8, 2005
Konstantellos, Christ	Vice President	Dec 30, 2002	Dec 30, 2002	Mar 8, 2005
Krause, Alan J.	Senior Vice President	Dec 30, 2002	Dec 30, 2002	Mar 8, 2005
Krause, Alan J.	President of Natural Resources, Industry and	Jan 5, 2005	Jan 5, 2005	Mar 8, 2005

Infrastructure				
Kvasnicka, Kenneth W.	Vice President	Mar 16, 2002	Mar 16, 2002	Mar 8, 2005
Lee, Howard E.	Vice President	Mar 9, 2004	Mar 9, 2004	Mar 8, 2005
Lewis, Jr., Richard S.	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Lindell, James E.	Vice President	Dec 30, 2002	Dec 30, 2002	Mar 8, 2005
Llort, Gabriel	Vice President	Dec 30, 2002	Dec 30, 2002	Mar 8, 2005
Mallon, Kathryn L.	Vice President	Aug 13, 2003	Aug 13, 2003	Mar 8, 2005
Mansour, Souheil	Vice President	Mar 9, 2004	Mar 9, 2004	Mar 8, 2005
Maurer, Richard W.	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
McClure, Michael L.	Vice President	Mar 16, 2002	Mar 16, 2002	Mar 8, 2005
McConville, Daniel	Senior Vice President	Mar 9, 2004	Mar 9, 2004	Mar 8, 2005
McHie, William F.	Vice President	Aug 13, 2003	Aug 13, 2003	Mar 8, 2005
Mergenthaler, Augustus M.	Vice President	Mar 9, 2004	Mar 9, 2004	Mar 8, 2005
Miller, Jr., Donald	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Minnick, Eugene W.	Vice President	Mar 8, 2005	Mar 8, 2005	Mar 8, 2005
Molander, Jarl W.	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Monroe, Kevin H.	Vice President	Mar 8, 2005	Mar 8, 2005	Mar 8, 2005
Moser, Mark S.	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Moser, William H.	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Moutal, Harvey P.	Vice President	Aug 13, 2003	Aug 13, 2003	Mar 8, 2005
Moutes, John G.	Senior Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Munce, Lyle D.	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005

Musgrave, Michael D.	Vice President	2001 Dec 30, 2002	2001 Dec 30, 2002	2005 Mar 8, 2005
Niesen, Kathleen A.	Vice President	Aug 13, 2003	Aug 13, 2003	Mar 8, 2005
Notte, Jerry J.	Vice President	Mar 11, 2003	Mar 11, 2003	Mar 8, 2005
Nottoli, Judy A.	Vice President	Aug 11, 2004	Aug 11, 2004	Mar 8, 2005
Obermeyer, James R.	Vice President	Mar 8, 2005	Mar 8, 2005	Mar 8, 2005
Okusu, Nora M	Vice President	Mar 11, 2003	Mar 11, 2003	Mar 8, 2005
Pansic, Nicholas	Vice President	Nov 12, 2002	Nov 12, 2002	Mar 8, 2005
Parent, Robert A.	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Payne, Thomas G.	Assistant Treasurer	Mar 11, 2003	Mar 11, 2003	Mar 8, 2005
Pena, Jr., Jerry	Vice President	Aug 11, 2004	Aug 11, 2004	Mar 8, 2005
Perry-Schlicher, Roberta	Vice President	Mar 8, 2005	Mar 8, 2005	Mar 8, 2005
Petrik, Bruce A.	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Pintabona, Robert	Vice President	Aug 11, 2005	Aug 11, 2005	Aug 11, 2005
Pisano, William C.	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Plattsmier, John R.	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Postma, Stanley S.	Vice President	Mar 8, 2005	Mar 8, 2005	Mar 8, 2005
Powers, William B.	Vice President	Mar 9, 2004	Mar 9, 2004	Mar 8, 2005
Profilet, Jr., Charles W.	Vice President	Mar 9, 2004	Mar 9, 2004	Mar 8, 2005
Radek, Matthew G	Vice President	Mar 11, 2003	Mar 11, 2003	Mar 8, 2005
Rashidi, Abdul S.	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Reisbord, Susan M.	Vice President	Mar 8,	Mar 8,	Mar 8,

		2005	2005	2005
Robinson, Charles D.	Vice President	Mar 8, 2005	Mar 8, 2005	Mar 8, 2005
Rowlett, J. Thomas	Vice President	Aug 15, 2001	Aug 15, 2001	Mar 8, 2005
Rudolph, Ronald L.	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Ruscitto, David G.	Vice President	Aug 11, 2005	Aug 11, 2005	Aug 11, 2005
Scharnhorst, Vicki J.	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Schillaci, Joseph A.	Vice President	Mar 8, 2005	Mar 8, 2005	Mar 8, 2005
Schubach, Robert	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Scott, John D.	Vice President	Mar 16, 2002	Mar 16, 2002	Mar 8, 2005
Searles, Sean Patrick	Vice President	Mar 11, 2003	Mar 11, 2003	Mar 8, 2005
Sehgal, Chander K.	Vice President	Dec 30, 2002	Dec 30, 2002	Mar 8, 2005
Senon, Constantino M.	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Skinner, John T.	Treasurer	Mar 9, 2004	Mar 9, 2004	Mar 8, 2005
Skolds, Lisa M	Vice President	Mar 8, 2005	Mar 8, 2005	Mar 8, 2005
Slapper, Jeffrey B.	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Smith, Donald L.	President	Mar 8, 2005	Mar 8, 2005	Mar 8, 2005
Smith, Donald L.	President of Business Solutions Group	Jan 5, 2005	Jan 5, 2005	Mar 8, 2005
Smith, Emmitt G.	Vice President	Aug 11, 2005	Aug 11, 2005	Aug 11, 2005
Spiegel, Donald J.	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Stephenson, Roger V.	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Summers, Paul C.	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Swanson, William R.	Vice President	Mar 9,	Mar 9,	Mar 8,

		2004	2004	2005
Swatek, Mark A.	President of Municipal and State Services	Jan 5, 2005	Jan 5, 2005	Mar 8, 2005
Taggart, David A.	Secretary	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Tait, Joseph	Vice President	Aug 11, 2005	Aug 11, 2005	Aug 11, 2005
Tarbox, Glenn S.	Vice President	Dec 30, 2002	Dec 30, 2002	Mar 8, 2005
Targett, John F.	Vice President	Dec 30, 2002	Dec 30, 2002	Mar 8, 2005
Tate, Carol H.	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Tekippe, Rudy J.	Senior Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Thompson, A. Robert	Vice President	Aug 14, 2002	Aug 14, 2002	Mar 8, 2005
Trouille, Bruno	Vice President	Dec 30, 2002	Dec 30, 2002	Mar 8, 2005
Uhler, Robert B.	Chairman of the Board	Mar 16, 2002	Mar 16, 2002	Mar 8, 2005
Uhler, Robert B.	Chief Executive Officer	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Umphres, Margaret B.	Vice President	Mar 16, 2002	Mar 16, 2002	Mar 8, 2005
Upton, Ernest J.	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Urquhart, Anthony Paul	Vice President	Mar 8, 2005	Mar 8, 2005	Mar 8, 2005
Vagt, Peter J.	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Velon, John P.	Vice President	Aug 15, 2001	Aug 15, 2001	Mar 8, 2005
Waller, Philip L.	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Wankmuller, Richard N.	Senior Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Ward, Robert A.	Assistant Treasurer	Mar 11, 2003	Mar 11, 2003	Mar 8, 2005
Ward, Robert A.	Vice President	Aug 14, 2002	Aug 14, 2002	Mar 8, 2005
Warren, Gary L.	Vice President	Aug 15,	Aug 15,	Mar 8,

		2001	2001	2005
Watson, Mike B.	Vice President	Mar 8, 2005	Mar 8, 2005	Mar 8, 2005
Watt, Ralph L.	Vice President	Dec 30, 2002	Dec 30, 2002	Mar 8, 2005
West, Calvin E.	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Williams, Quentin R.	Vice President	Aug 13, 2003	Aug 13, 2003	Mar 8, 2005
Winstead, Huron F.	Vice President	Aug 11, 2005	Aug 11, 2005	Aug 11, 2005
Wojslaw, Joseph A.	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Wolfe, Timothy A.	Vice President	Mar 24, 2001	Mar 24, 2001	Mar 8, 2005
Yaussi, Louis A.	Vice President	Mar 8, 2005	Mar 8, 2005	Mar 8, 2005
Zipparro, Vincent J.	Vice President	Dec 30, 2002	Dec 30, 2002	Mar 8, 2005

Other

	Title	Effective	First Elected	Last Elected
Atoulikian, Richard G.	Qualifier	Oct 22, 2001	Oct 22, 2001	
Bennett, Lawrence J.	Qualifier	Sep 14, 2001	Sep 14, 2001	
Bennett, Lawrence J.	Qualifier	Jun 24, 1998	Jun 24, 1998	
Biggers, Mark A.	Qualifier	Jan 3, 2002	Jan 3, 2002	
Bratz, Cyndy L.	Qualifier	Sep 14, 2001	Sep 14, 2001	
Buettner, Walter G.	Qualifier	Nov 15, 2002	Nov 15, 2002	Nov 15, 2002
Carthew, Geoffrey A.	Qualifier	Aug 17, 2001	Aug 17, 2001	
Coon, Jeffrey L.	Qualifier	Sep 7, 2000	Sep 7, 2000	Sep 7, 2000
Coon, Jeffrey L.	Qualifier	Aug 15, 2005	Aug 15, 2005	Aug 15, 2005
Corser, Patrick G.	Qualifier	Jan 22, 2001	Jan 22, 2001	Jan 22, 2001

Corser, Patrick G.	Qualifier	Dec 19, 2002	Dec 19, 2002	Dec 19, 2002
Corser, Patrick G.	Qualifier	Sep 14, 2001	Sep 14, 2001	
Crook, Barrett C.	Qualifier	Sep 14, 2001	Sep 14, 2001	
Davert, Jr., Marshall W.	Qualifier	Aug 17, 2001	Aug 17, 2001	
Dorward, Martin T.	Qualifier	Feb 10, 2004	Feb 10, 2004	Feb 10, 2004
Duran, Francis E.	Qualifier	Mar 27, 2002	Mar 27, 2002	
Frissora, Joseph	Qualifier	May 4, 2000	May 4, 2000	May 4, 2000
Frutchey, Robert W.	Qualifier	Oct 22, 2001	Oct 22, 2001	
Garner, Robert W.	Qualifier	May 13, 2004	May 13, 2004	May 13, 2004
Glaser, Harold T.	Qualifier	Aug 17, 2001	Aug 17, 2001	
Gossett, James W.	Qualifier	Jul 7, 1997	Jul 7, 1997	
Hartley, Raymond G.	Qualifier	Feb 12, 2002	Feb 12, 2002	
Johnson, Keith A.	Qualifier	Sep 14, 2001	Sep 14, 2001	
Jokela, J. Brett	Qualifier	Jan 3, 1994	Jan 3, 1994	
Lewis, Jr., Richard S.	Qualifier	Aug 17, 2001	Aug 17, 2001	
Lynard, William G.	Qualifier	Sep 14, 2001	Sep 14, 2001	
Mayers, Robert J.	Qualifier	Sep 14, 2001	Sep 14, 2001	
McHie, William F.	Qualifier	Apr 2, 2002	Apr 2, 2002	
Miller, Jr., Donald	Qualifier	Mar 10, 1999	Mar 10, 1999	
Monier, Roy M.	Qualifier	Sep 14, 2001	Sep 14, 2001	
Moser, Mark S.	Qualifier	May 9, 2001	May 9, 2001	May 9, 2001
Moughamian, Matthew	Qualifier	Sep 14, 2001	Sep 14, 2001	

Naylor, Patrick N.	Qualifier	Sep 14, 2001	Sep 14, 2001	
Notte, Jerry J.	Qualifier	Jun 12, 2002	Jun 12, 2002	Jun 12, 2002
Pisano, William C.	Qualifier	Jun 24, 1999	Jun 24, 1999	Jun 24, 1999
Quach, Can T.	Qualifier	Sep 14, 2001	Sep 14, 2001	
Quach, Can T.	Qualifier	Jan 3, 1994	Jan 3, 1994	
Scharnhorst, Vicki J.	Qualifier	Feb 28, 2001	Feb 28, 2001	
Scharre, David C.	Qualifier	Nov 15, 2002	Nov 15, 2002	Nov 15, 2002
Schubach, Robert	Qualifier	Oct 22, 2001	Oct 22, 2001	
Tate, Carol H.	Qualifier	Aug 17, 2001	Aug 17, 2001	
Upton, Ernest J.	Qualifier	Sep 14, 2001	Sep 14, 2001	
Vagt, Peter J.	Qualifier	Sep 29, 2000	Sep 29, 2000	
West, Calvin E.	Qualifier	Mar 29, 1996	Mar 29, 1996	
Konstantellos, Christ	Qualifier	Feb 20, 2004	Feb 20, 2004	Feb 20, 2004
Moser, Mark S.	License Holder		Aug 8, 2002	
Smith, Donald L.	Qualifier	Aug 17, 2001	Aug 17, 2001	
Tolaney, Murli	Qualifier	Aug 17, 2001	Aug 17, 2001	
Velon, John P.	Qualifier	Nov 15, 2002	Nov 15, 2002	Nov 15, 2002
Wilson, Stanley C.	Registered Agent	May 2, 2005	May 2, 2005	May 2, 2005
Wood, Brian John	General Manager, South Asia-Pacific	Jan 5, 2004	Jan 5, 2004	Jan 5, 2004